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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 218

[Docket No. 170919913-9271-02]

RIN 0648-BH27

Taking and Importing Marine Mammals; Taking Marine Mammals Incidental to U.S.

Navy Marine Structure Maintenance and Pile Replacement in Washington

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Final rule.

SUMMARY: NMFS, upon request of the U.S. Navy (Navy), hereby issues regulations to govern the unintentional taking of marine mammals incidental to conducting construction activities related to marine structure maintenance and pile replacement at facilities in Washington, over the course of five years. These regulations, which allow for the issuance of Letters of Authorization (LOA) for the incidental take of marine mammals during the described activities and specified timeframes, prescribe the permissible methods of taking and other means of effecting the least practicable adverse impact on marine mammal species or stocks and their habitat, as well as requirements pertaining to the monitoring and reporting of such taking.

DATES: Effective from *[insert date 30 days after date of publication in the FEDERAL REGISTER]* through May 17, 2024.

ADDRESSES: A copy of the Navy's application and supporting documents, as well as a list of the references cited in this document, may be obtained online at:

www.fisheries.noaa.gov/action/incidental-take-authorization-us-navy-marine-structure-maintenance-and-pile-replacement-wa. In case of problems accessing these documents, please call the contact listed below.

FOR FURTHER INFORMATION CONTACT: Ben Laws, Office of Protected Resources, NMFS, (301) 427-8401.

SUPPLEMENTARY INFORMATION:

Purpose and Need for Regulatory Action

These regulations establish a framework under the authority of the MMPA (16 U.S.C. 1361 *et seq.*) to allow for the authorization of take of marine mammals incidental to the Navy's construction activities related to marine structure maintenance and pile replacement at facilities in Washington.

We received an application from the Navy requesting five-year regulations and authorization to take multiple species of marine mammals. Take is expected to occur by Level A and Level B harassment incidental to impact and vibratory pile driving. Please see "Background" below for definitions of harassment.

Legal Authority for the Action

Section 101(a)(5)(A) of the MMPA (16 U.S.C. 1371(a)(5)(A)) directs the Secretary of Commerce to allow, upon request, the incidental, but not intentional taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region for up to five years if, after notice and public comment, the agency makes certain findings and issues regulations that set forth permissible methods of taking pursuant to that activity and other means of effecting the "least practicable adverse impact" on the affected species or stocks and their habitat (see the discussion below in

the “Mitigation” section), as well as monitoring and reporting requirements. Section 101(a)(5)(A) of the MMPA and the implementing regulations at 50 CFR part 216, subpart I, provide the legal basis for issuing this rule containing five-year regulations, and for any subsequent LOAs. As directed by this legal authority, the regulations contain mitigation, monitoring, and reporting requirements.

Summary of Major Provisions within the Regulations

Following is a summary of the major provisions of the regulations regarding Navy construction activities. These measures include:

- Required monitoring of the construction areas to detect the presence of marine mammals before beginning construction activities.
- Shutdown of construction activities under certain circumstances to avoid injury of marine mammals.
- Soft start for impact pile driving to allow marine mammals the opportunity to leave the area prior to beginning impact pile driving at full power.

Background

Section 101(a)(5)(A) of the MMPA (16 U.S.C. 1361 *et seq.*) directs the Secretary of Commerce (as delegated to NMFS) to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made, regulations are issued, and notice is provided to the public.

An authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s), will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant), and if the

permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such takings are set forth.

NMFS has defined “negligible impact” in 50 CFR 216.103 as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.

The MMPA states that the term “take” means to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal.

Except with respect to certain activities not pertinent here, the MMPA defines “harassment” as: any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

Summary of Request

On July 24, 2017, we received an adequate and complete request from the Navy for authorization to take marine mammals incidental to construction activities related to marine structure maintenance and pile replacement at six Naval installations in Washington inland waters. On August 4, 2017 (82 FR 36359), we published a notice of receipt of the Navy’s application in the *Federal Register*, requesting comments and information related to the request for thirty days. We received comments from Whale and Dolphin Conservation (WDC). The comments received from WDC were considered in development of the proposed rule and are available online at: www.fisheries.noaa.gov/action/incidental-take-authorization-us-navy-marine-structure-maintenance-and-pile-replacement-wa. We subsequently published a notice of

proposed rulemaking in the *Federal Register* on March 5, 2018 (83 FR 9366). Comments received during the public comment period on the proposed regulations are addressed in “Comments and Responses.”

The Navy plans to conduct construction necessary for maintenance of existing in-water structures at the following facilities: Naval Base Kitsap (NBK) Bangor, NBK Bremerton, NBK Keyport, NBK Manchester, Zelatched Point, and Naval Station Everett (NS Everett). These repairs include use of impact and vibratory pile driving, including installation and removal of steel, concrete, plastic, and timber piles. Hereafter (unless otherwise specified or detailed) we use the term “pile driving” to refer to both pile installation and pile removal. The use of both vibratory and impact pile driving is expected to produce underwater sound at levels that have the potential to result in harassment of marine mammals.

The Navy requests authorization to take individuals of 10 species by Level B harassment. Take by Level A harassment is anticipated only for the harbor seal. These regulations are valid for five years (2019-2024).

Description of the Specified Activity

Overview

Maintaining existing wharfs and piers is vital to sustaining the Navy’s mission and ensuring readiness. To ensure continuance of necessary missions at the six installations, the Navy must conduct annual maintenance and repair activities at existing marine waterfront structures, including removal and replacement of piles of various types and sizes. The Navy refers to this program as the Marine Structure Maintenance and Pile Replacement (MPR) program. Exact timing and amount of necessary in-water work is unknown, but the Navy estimates replacing up to 822 structurally unsound piles over the 5-year period, including

individual actions currently planned and estimates for future marine structure repairs.

Construction will include use of impact and vibratory pile driving, including removal and installation of steel, concrete, plastic, and timber piles. Aspects of construction activities other than pile driving are not anticipated to have the potential to result in incidental take of marine mammals because they are either above water or do not produce levels of underwater sound with likely potential to result in take of marine mammals.

The Navy's waterfront inspection program prioritizes deficiencies in marine structures and plans those maintenance and repairs for design and construction. The Navy's planned activities include individual projects (where an existing need has been identified and funds have been requested) and estimates for emergent or emergency repairs. The latter are also referred to as contingency repairs. Estimates of activity levels for contingency repairs are based on Navy surveys of existing structures, which provide assessments of structure condition and estimates of numbers of particular pile types that may require replacement (at an assumed 1:1 ratio) over the 5-year duration of these regulations. Additional allowance is made for the likelihood that future waterfront inspections will reveal unexpected damage, or that damage caused by severe weather events and/or incidents caused by vessels will result in need for additional contingency repairs.

LOAs could be issued for projects conducted at any of the six facilities if they fit within the structure of the programmatic analysis provided herein and are able to meet the requirements described in the regulations. The Navy will meet with NMFS on an annual basis prior to the start of in-water work windows to review upcoming projects, required monitoring plans, and the results of relevant projects conducted in the preceding in-water work window. The intent is to utilize lessons learned to better inform potential effects of future MPR activities and in any follow-up consultations.

Dates and Duration

These regulations are valid for a period of five years (2019-2024). The specified activities may occur at any time during the five-year period of validity of the regulations, subject to existing timing restrictions. These timing restrictions, or in-water work windows, are typically designed to protect fish species listed under the Endangered Species Act (ESA). For NBK Bangor and Zelatched Point (located in Hood Canal), in-water work may occur from July 16 through January 15. At the remaining four facilities (located in Puget Sound), in-water work may occur from July 16 through February 15. Impact or vibratory driving could occur on any work day within in-water work windows during the period of validity of these regulations.

For many projects the design details are not known; thus, it is not possible to state the number of pile driving days that will be required. Days of pile driving at each site were based on the estimated work days using a slow production rate, i.e., one pile removed per day and one pile installed per day for contingency pile driving and an average production rate of six piles per day for fender pile replacement. These conservative rates give the following estimates of total days at each facility over the 5-year duration: NBK Bangor, 119 days; Zelatched Point, 20 days; NBK Bremerton, 168 days; NBK Keyport, 20 days; NBK Manchester, 50 days; and NS Everett, 78 days. These totals include both extraction and installation of piles, and represent a conservative estimate of pile driving days at each facility. In a real construction situation, pile driving production rates would be maximized when possible and actual daily production rates may be higher, resulting in fewer actual pile driving days.

Specified Geographical Region

The six installations are located within the inland waters of Washington State. Two facilities are located within Hood Canal, while the remainder are located within Puget Sound. Please see Figure 1-1 of the Navy's application for a regional map.

NBK Bangor and Zelatched Point are located in the Hood Canal, a long, narrow, fjord-like basin of western Puget Sound. Please see Figures 1-2 and 1-6 of the Navy's application. NBK Bremerton is located on the north side of Sinclair Inlet in southern Puget Sound. Please see Figure 1-3 of the Navy's application. NBK Keyport is located on the eastern shore of the Kitsap Peninsula. Please see Figure 1-4 of the Navy's application. NBK Manchester is located on Orchard Point, approximately 6.4 km due east of Bremerton. Please see Figure 1-5 of the Navy's application. NS Everett is located in Port Gardner Bay in Puget Sound's Whidbey Basin. Please see Figure 1-7 of the Navy's application.

For additional detail regarding the specified geographical region, please see our notice of proposed rulemaking (83 FR 9366; March 5, 2018) and Section 2 of the Navy's application.

Detailed Description of Activities

As described above, the Navy requested incidental take regulations for its MPR program, which includes maintenance and repair activities at marine waterfront structures at six installations within Washington inland waters. In order to address identified deficiencies in existing marine structures at the six facilities, the Navy plans to replace up to 822 structurally unsound piles over the 5-year period using both impact and vibratory pile driving. Existing marine structures at the six facilities are identified in Table 1-2 of the Navy's application. The MPR program includes pile repair, extraction, and installation, all of which may be accomplished through a variety of methods. However, only pile extraction and installation using vibratory and impact pile drivers is expected to have the potential to result in incidental take of marine

mammals. A detailed description of the Navy’s planned activities was provided in our notice of proposed rulemaking (83 FR 9366; March 5, 2018) and is not repeated here. No changes have been made to the specified activities described therein.

Steel piles are typically vibratory-driven for their initial embedment depths or to refusal and finished with an impact hammer for proofing or until the pile meets structural requirements, as necessary. Non-steel piles (concrete, timber, or plastic) are typically impact-driven for their entire embedment depth, in part because non-steel piles are often displacement piles (as opposed to pipe piles) and require some impact to allow substrate penetration. Pile installation can typically take a minute or less to 60 minutes depending on pile type, pile size, and conditions (i.e., bedrock, loose soils, etc.) to reach the required tip elevation.

Impact or vibratory pile driving could occur on any day, but would not occur simultaneously. Location-specific pile totals are given in Table 1 and described below. These totals assume a 1:1 replacement ratio; however, the actual number installed may result in a replacement ratio of less than 1:1. Please see Table A-1 of the Navy’s application for additional detail regarding expectations for both planned work and possible contingency work.

Table 1. Pile Types and Maximum Anticipated Number to Be Replaced at Each Installation.

Installation	Existing Piles to be Replaced	Anticipated Piles to be Installed
NBK Bangor	44 concrete 75 steel and/or timber	119 steel or concrete
NBK Bremerton	75 steel and/or timber 460 timber	100 steel (14-in diameter and sheet piles) 435 concrete
NBK Keyport	20 steel and/or concrete	20 steel
NBK Manchester	50 timber and/or plastic	50 concrete, timber, and/or plastic
Zelatched Point	20 timber	20 steel, concrete, and/or timber
NS Everett	1 steel, 2 concrete, and 75 timber	1 steel and 77 concrete and/or timber

Steel piles would be a maximum size of 36-inch (in) diameter except at NBK Bremerton where they would be 14-in diameter. Concrete piles will be a maximum of 24-in diameter and

timber/plastic piles will be a maximum of 18-in diameter. For purposes of analysis, it is assumed that any unknown pile type would be steel, since this provides a worst-case scenario in terms of noise levels produced. All concrete, timber, and plastic piles are assumed to be installed entirely by impact pile driver, and all steel piles are assumed to require some use of an impact driver. This is a conservative assumption, as all steel piles would be initially driven with a vibratory driver until they reach a point of refusal (where substrate conditions make use of a vibratory hammer ineffective) or engineering specifications require impact driving to verify load-bearing capacity. Therefore, some steel piles may not in fact require use of the impact driver during installation.

Of 822 piles expected to be installed as replacement piles, 121 have been identified as steel piles. These piles will be installed over the 5-year duration at NBK Bremerton, NBK Keyport, and NS Everett. In addition, another 139 piles that would be installed at NBK Bangor (119) and Zelatched Point (20) have not been identified as to pile type and could be steel, concrete, timber, or plastic. For this analysis, it is assumed all 139 of these would be steel piles. Therefore, 260 piles are assumed to be steel, with 100 of these 14-in and the remainder assumed to be 36-in diameter. A total of 435 replacement piles have been identified as concrete (NBK Bremerton). The remaining 127 replacement piles (NBK Manchester and NS Everett) could ultimately be concrete, timber, or plastic, but are assumed for purposes of analysis to be concrete, which is a more conservative noise scenario.

Comments and Responses

We published a notice of proposed rulemaking in the *Federal Register* on March 5, 2018 (83 FR 9366). During the 30-day comment period, we received letters from the Marine Mammal Commission (Commission) and WDC. The comments and our responses are described below.

For full detail of the comments and recommendations, please see the comment letters, which are available online at: www.fisheries.noaa.gov/action/incidental-take-authorization-us-navy-marine-structure-maintenance-and-pile-replacement-wa.

Comment: The Commission recommends that NMFS should consult with scientists and acousticians to determine the appropriate accumulation time that action proponents should use to determine the extent of Level A harassment zones based on the associated cumulative sound exposure level (cSEL) thresholds in such situations. The Commission further recommends that NMFS consult with both internal and external scientists and acousticians to determine the appropriate accumulation time that action proponents should use to determine the extent of the Level A harassment zones based on the associated cSEL thresholds for the various types of sound sources, including stationary sound sources, when simple area x density methods are employed.

Response: NMFS appreciates the Commission's interest in these issues, and we agree that these are important issues needing further consideration. Therefore, NMFS will continue to consider and refine our approach to assessing the appropriate calculation of Level A harassment through future actions as more information and experience is available. However, we also note that the Commission itself has a nine-member Committee of Scientific Advisors, including experts on the very topics mentioned, in addition to a professional staff including subject matter experts on marine mammal behavior and acoustics. As such, we would welcome in the future any more substantive recommendations relating to these issues that the Commission wishes to provide.

In addition, as described in NMFS's 2018 *Revision to Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing* (NMFS, 2018), NMFS is

committed to re-examining the default 24-hour accumulation period and has convened a working group to investigate alternative means of identifying appropriate accumulation periods.

Comment: The Commission recommends NMFS share its criteria for rounding take estimates with the Commission.

Response: On June 27, 2018, NMFS provided the Commission with its internal guidance on rounding and the consideration of additional factors in take estimation.

Comment: WDC recommends that NMFS and the Navy consult on the status of marine mammal populations on a yearly basis at minimum, and with greater frequency regarding southern resident killer whales (SRKW). In addition, WDC suggests that the Navy must communicate and coordinate with Washington State on the status of localized impacts to SRKW for each project site, during the time of each construction project.

Response: We appreciate WDC's comments and share, generally, their concern regarding the status of the endangered SRKW population. However, as discussed herein and as separately evaluated through NMFS's consultation under section 7 of the ESA, the Navy's construction actions (and NMFS's potential issuance of LOAs for take of marine mammals incidental to those actions) do not present meaningful concern relating to impacts on SRKW. In most locations, SRKW are not expected to be present and, where they could be encountered, the Navy has committed to robust monitoring and mitigation requirements. As such, the requirement to meet annually (as proposed) is sufficient for information exchange regarding ongoing and future actions associated with the Navy's MPR program. With regard to the need to consult with Washington State, it is outside NMFS's jurisdiction to require such consultation of the Navy. The Navy will consult with Washington State in accordance with applicable state law.

Comment: WDC disagrees with statements in our notice of proposed rulemaking regarding the likely presence of SRKW individuals in the vicinity of Navy facilities, and suggests that the estimated taking of SRKW as a result of the specified activities is underestimated. WDC supports this recommendation in part by stating that the occurrence of SRKW in Puget Sound, which is likely determined by the presence and abundance of seasonally-preferred salmon runs, has been highly variable in recent years. WDC recommends reconsideration of the number of SRKW that may be taken by the specified activity.

Response: We first clarify that WDC apparently misunderstands our previous statement relating to expected SRKW occurrence. Rather than stating that SRKW occur “only rarely and unpredictably” in the Puget Sound region as a whole, as WDC comments, we noted that SRKW (among other species considered herein) occur only rarely and unpredictably in the vicinity of Navy facilities. Reiterating our discussion in the notice of proposed rulemaking, SRKW have not been reported in Hood Canal (NBK Bangor and Zelatched Point) since 1995. The most recent confirmed sighting of SRKW near NBK Bremerton and Keyport was in Dyes Inlet in 1997. SRKW occur only rarely in far southern Puget Sound, near NBK Manchester. We acknowledged that SRKW are more likely to occur in the vicinity of NS Everett.

Even at these latter two facilities (NBK Manchester and NS Everett), a density-based analysis would lead to an assumption that SRKW takes are unlikely, given the generally small acoustic harassment zones (other than when vibratory driving steel piles) and low number of expected days on which pile driving would occur under the MPR. Further, the robust monitoring requirements that will be required of the Navy—including a commitment to monitor local sightings networks and avoid pile driving when SRKW are known to be in the vicinity of a facility—in conjunction with the Navy’s commitment to cease pile driving if SRKW (and

cetaceans in general) are detected at any distance strengthen the conclusion that take of SRKW is unlikely. However, in recognition that it is possible that SRKW could briefly enter a harassment zone undetected during vibratory pile driving of steel piles (when harassment zones are largest), we include analysis of a precautionary amount of take (equivalent to two occurrences of J pod or one occurrence of L pod). The best available information supports a conclusion that this amount of take by Level B harassment is sufficient, and WDC provides no specific information to the contrary.

Comment: WDC similarly suggests that the take number provided for transient killer whales is underestimated, citing take estimates produced for previous incidental take authorizations for Navy construction activities in Hood Canal.

Response: As for SRKW, the best available information, including local sightings data—described in our notice of proposed rulemaking—suggest that transient killer whales are unlikely to occur in the vicinity of Navy construction activities. The take estimate considered herein considers available information regarding group size and a reasonable estimate of days on which transient killer whales may be present, given their rarity, small acoustic harassment zones for most pile driving, and few days on which pile driving is expected to occur. The incidental take authorization cited by WDC (83 FR 10689; March 12, 2018) included an extremely precautionary take estimate, as has occurred for other past Navy authorization requests for construction activities specific to the Hood Canal. We note that, although relatively large amounts of take have been authorized for transient killer whales in association with such activities—since 2010, nine IHAs have been issued to the Navy for construction activities at NBK Bangor in Hood Canal—no killer whale observations have ever been reported during construction activities, and no actual takes are believed to have occurred.

Overall, with regard to both SRKW and transient killer whales, we believe that the take estimates analyzed herein reasonably reflect the available information and should be expected to be reasonably reflective of the actual potential for killer whale occurrence in the vicinity of Navy facilities during the specified construction activities. However, these regulations also include an adaptive management component that will allow Navy and NMFS to evaluate on an annual basis whether these assumptions remain accurate.

Comment: With regard to mitigation and monitoring, WDC recommends ensuring that the Navy uses adequate numbers and placement of marine mammal observers to detect killer whales at all project sites, to ensure awareness regarding updated information on killer whale presence, and to utilize citizen sightings networks on a daily basis to monitor for presence and activity of killer whales in the area before construction activities begin. WDC also recommends ensuring that observers have sufficient training to differentiate between resident and transient killer whales.

Response: We agree with WDC regarding these measures, all of which were included in our notice of proposed rulemaking and are carried forward in these final regulations. However, we do caution that identification of transient versus resident killer whales may be difficult, although observers will be required to have sufficient training and experience to make such determinations, within reason.

Comment: WDC encourages “extensive use of the proposed hydroacoustic system” to detect the presence of marine mammals. In addition, WDC states that this unspecified system should be used to measure localized levels of underwater noise at project sites and, in conjunction with a threshold level to be determined, that construction activities not be allowed to proceed if background noise levels are above some predetermined level.

Response: Overall, this proposal is too vague to reasonably be acted upon. It is unclear what “proposed hydroacoustic system” WDC is referring to, and significantly greater detail would need to be provided with regard to the technical specifications of such a system as well as with regard to the data to be collected and its monitoring in order to meaningfully evaluate such a proposal. It is also unclear what WDC suggests as an appropriate threshold for background noise. Moreover, even if we assume that a passive acoustic monitoring system exists in conjunction with the capacity to monitor data in real-time, the proposal to not allow construction activities if background noise is above a specified threshold would likely be considered impracticable, as the level of background noise is outside the Navy’s control, such a requirement could significantly constrain Navy’s ability to conduct necessary construction activities, and the requirement would be of uncertain benefit to affected marine mammals.

Description of Marine Mammals in the Area of the Specified Activity

We have reviewed the Navy’s species descriptions—which summarize available information regarding status and trends, distribution and habitat preferences, behavior and life history, and auditory capabilities of the potentially affected species—for accuracy and completeness and refer the reader to Sections 3 and 4 of the Navy’s application, instead of reprinting the information here. Additional information regarding population trends and threats may be found in NMFS’s Stock Assessment Reports (SAR; www.fisheries.noaa.gov/topic/population-assessments#marine-mammals) and more general information about these species (e.g., physical and behavioral descriptions) may be found on NMFS’s website (www.fisheries.noaa.gov/find-species).

Table 2 lists all species with expected potential for occurrence in the specified geographical region where the Navy proposes to conduct the specified activities and summarizes

information related to the population or stock, including regulatory status under the MMPA and ESA and potential biological removal (PBR), where known. For taxonomy, we follow Committee on Taxonomy (2017). PBR, defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population, is considered in concert with known sources of ongoing anthropogenic mortality (as described in NMFS's SARs).

Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated within a particular study or survey area. NMFS's stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprises that stock. All managed stocks in the specified geographical region are assessed in either NMFS's U.S. Alaska SARs or U.S. Pacific SARs. All values presented in Table 2 are the most recent available at the time of writing, including updated information provided in the draft 2018 SARs (available online at: www.fisheries.noaa.gov/national/marine-mammal-protection/draft-marine-mammal-stock-assessment-reports).

Ten species (with 13 managed stocks) are considered to have the potential to co-occur with Navy activities. There are several species or stocks that occur in Washington inland waters, but which are not expected to occur in the vicinity of the six Naval installations. These species may occur in waters of the Strait of Juan de Fuca or in more northerly waters in the vicinity of the San Juan Islands and areas north to the Canadian border, and include the Pacific white-sided dolphin (*Lagenorhynchus obliquidens*) and the northern resident stock of killer whales. In addition, the sea otter is found in coastal waters, with the northern (or eastern) sea otter (*Enhydra*

lutris kenyoni) found in Washington. However, sea otters are managed by the U.S. Fish and Wildlife Service and are not considered further in this document.

Two populations of gray whales are recognized, eastern and western North Pacific (ENP and WNP). As discussed in greater detail in our notice of proposed rulemaking (83 FR 9366; March 5, 2018), there is no indication that WNP whales occur in waters of Hood Canal or southern Puget Sound, and it is extremely unlikely that a gray whale in close proximity to Navy construction activity would be one of the few WNP whales that have been documented in the eastern Pacific. The likelihood that a WNP whale would be present in the vicinity of Navy construction activities is insignificant and discountable, and WNP gray whales are omitted from further analysis.

Table 2. Marine Mammals Potentially Present in the Vicinity of Navy Construction Activities.

Common name	Scientific name	Stock	ESA/MMPA status; Strategic (Y/N) ¹	Stock abundance (CV, N _{min} , most recent abundance survey) ²	PBR	Annual M/SI ³
Order Cetartiodactyla – Cetacea – Superfamily Mysticeti (baleen whales)						
Family Eschrichtiidae						
Gray whale	<i>Eschrichtius robustus</i>	Eastern North Pacific	-; N	26,960 (0.05; 25,849; 2016)	801	138
Family Balaenopteridae (rorquals)						
Humpback whale	<i>Megaptera novaeangliae kuzira</i>	California/Oregon/ Washington (CA/OR/WA)	E/D; Y	2,900 (0.03; 2,784; 2014)	16.7 ⁷	≥38.6
Minke whale	<i>Balaenoptera acutorostrata scammoni</i>	CA/OR/WA	-; N	636 (0.72; 369; 2014)	3.5	≥1.3
Superfamily Odontoceti (toothed whales, dolphins, and porpoises)						
Family Delphinidae						
Killer whale	<i>Orcinus orca</i> ⁴	West Coast Transient ⁵	-; N	243 (n/a; 2009)	2.4	0
		Eastern North Pacific Southern Resident	E/D; Y	77 (n/a; 2017)	0.13	0
Family Phocoenidae (porpoises)						
Harbor porpoise	<i>Phocoena phocoena vomerina</i>	Washington Inland Waters	-; N	11,233 (0.37; 8,308; 2015)	66	≥7.2
Dall’s porpoise	<i>Phocoenoides dalli dalli</i>	CA/OR/WA	-; N	25,750 (0.45; 17,954; 2014)	172	0.3
Order Carnivora – Superfamily Pinnipedia						
Family Otariidae (eared seals and sea lions)						
California sea lion	<i>Zalophus californianus</i>	United States	-; N	257,606 (n/a; 233,515; 2014)	14,011	≥319
Steller sea	<i>Eumetopias jubatus</i>	Eastern U.S.	-; N	41,638 (n/a; 2,498)	2,498	108

lion	<i>monteriensis</i>			2015)		
Family Phocidae (earless seals)						
Harbor seal	<i>Phoca vitulina richardii</i>	Washington Northern Inland Waters ⁶	-; N	11,036 (0.15; 7,213; 1999)	Undet.	9.8
		Southern Puget Sound ⁶	-; N	1,568 (0.15; 1,025; 1999)	Undet.	3.4
		Hood Canal ⁶	-; N	1,088 (0.15; 711; 1999)	Undet.	0.2
Northern elephant seal	<i>Mirounga angustirostris</i>	California Breeding	-; N	179,000 (n/a; 81,368; 2010)	4,882	8.8

¹Endangered Species Act (ESA) status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

²NMFS marine mammal stock assessment reports at: www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments. CV is coefficient of variation; N_{min} is the minimum estimate of stock abundance. In some cases, CV is not applicable. For two stocks of killer whales, the abundance values represent direct counts of individually identifiable animals; therefore there is only a single abundance estimate with no associated CV. For certain stocks of pinnipeds, abundance estimates are based upon observations of animals (often pups) ashore multiplied by some correction factor derived from knowledge of the species' (or similar species') life history to arrive at a best abundance estimate; therefore, there is no associated CV. In these cases, the minimum abundance may represent actual counts of all animals ashore.

³These values, found in NMFS' SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (e.g., commercial fisheries, subsistence hunting, ship strike). Annual M/SI often cannot be determined precisely and is in some cases presented as a minimum value. All M/SI values are as presented in the draft 2018 SARs.

⁴Transient and resident killer whales are considered unnamed subspecies (Committee on Taxonomy, 2017).

⁵The abundance estimate for this stock includes only animals from the "inner coast" population occurring in inside waters of southeastern Alaska, British Columbia, and Washington—excluding animals from the "outer coast" subpopulation, including animals from California—and therefore should be considered a minimum count. For comparison, the previous abundance estimate for this stock, including counts of animals from California that are now considered outdated, was 354.

⁶Abundance estimates for these stocks are not considered current. PBR is therefore considered undetermined for these stocks, as there is no current minimum abundance estimate for use in calculation. We nevertheless present the most recent abundance estimates, as these represent the best available information for use in this document.

⁷This stock is known to spend a portion of time outside the U.S. EEZ. Therefore, the PBR presented here is the allocation for U.S. waters only and is a portion of the total. The total PBR for humpback whales is 33.4 (one half allocation for U.S. waters). Annual M/SI presented is for U.S. waters only.

Additional detail regarding the affected species and stocks, including local occurrence data for each of the six Navy facilities, was provided in our notice of proposed rulemaking (83 FR 9366; March 5, 2018) and is not repeated here.

Marine Mammal Hearing

Hearing is the most important sensory modality for marine mammals underwater, and exposure to anthropogenic sound can have deleterious effects. To appropriately assess the

potential effects of exposure to sound, it is necessary to understand the frequency ranges marine mammals are able to hear. Current data indicate that not all marine mammal species have equal hearing capabilities (*e.g.*, Richardson *et al.*, 1995; Wartzok and Ketten, 1999; Au and Hastings, 2008). To reflect this, Southall *et al.* (2007) recommended that marine mammals be divided into functional hearing groups based on directly measured or estimated hearing ranges on the basis of available behavioral response data, audiograms derived using auditory evoked potential techniques, anatomical modeling, and other data. Note that no direct measurements of hearing ability have been successfully completed for mysticetes (*i.e.*, low-frequency cetaceans). Subsequently, NMFS (2018) described generalized hearing ranges for these marine mammal hearing groups. Generalized hearing ranges were chosen based on the approximately 65 dB threshold from the normalized composite audiograms, with an exception for lower limits for low-frequency cetaceans where the result was deemed to be biologically implausible and the lower bound from Southall *et al.* (2007) retained. The functional groups and the associated frequencies are indicated below (note that these frequency ranges correspond to the range for the composite group, with the entire range not necessarily reflecting the capabilities of every species within that group):

- Low-frequency cetaceans (mysticetes): Generalized hearing is estimated to occur between approximately 7 Hz and 35 kHz;
- Mid-frequency cetaceans (larger toothed whales, beaked whales, and most delphinids): Generalized hearing is estimated to occur between approximately 150 Hz and 160 kHz;
- High-frequency cetaceans (porpoises, river dolphins, and members of the genera *Kogia* and *Cephalorhynchus*; including two members of the genus *Lagenorhynchus*, on the basis

of recent echolocation data and genetic data): Generalized hearing is estimated to occur between approximately 275 Hz and 160 kHz;

- Pinnipeds in water; Phocidae (true seals): functional hearing is estimated to occur between approximately 50 Hz to 86 kHz;
- Pinnipeds in water; Otariidae (eared seals): functional hearing is estimated to occur between 60 Hz and 39 kHz for Otariidae.

For more detail concerning these groups and associated frequency ranges, please see NMFS (2018) for a review of available information. Ten marine mammal species (six cetacean and four pinniped (two otariid and two phocid) species) have the potential to co-occur with Navy construction activities. Please refer to Table 2. Of the six cetacean species that may be present, three are classified as low-frequency cetaceans (i.e., all mysticete species), one is classified as a mid-frequency cetacean (i.e., killer whales), and two are classified as high-frequency cetaceans (i.e., porpoises).

Potential Effects of the Specified Activity on Marine Mammals and Their Habitat

We provided discussion of the potential effects of the specified activity on marine mammals and their habitat in our *Federal Register* notice of proposed rulemaking (83 FR 9366; March 5, 2018). Therefore, we do not reprint the information here but refer the reader to that document. That document included a summary and discussion of the ways that components of the specified activity may impact marine mammals and their habitat, as well as general background information on sound. The “Estimated Take” section later in this document includes a quantitative analysis of the number of individuals that are expected to be taken by this activity. The “Negligible Impact Analysis and Determination” section considers the content of this section and the material it references, the “Estimated Take” section, and the “Mitigation” section,

to draw conclusions regarding the likely impacts of these activities on the reproductive success or survivorship of individuals and how those impacts on individuals are likely to impact marine mammal species or stocks.

Estimated Take

This section provides an estimate of the number of incidental takes for authorization, which will inform both NMFS’s consideration of whether the number of takes is “small” and the negligible impact determination.

Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines “harassment” as: any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

Take of marine mammals incidental to Navy construction activities could occur as a result of Level A or Level B harassment. Below we describe how the potential take is estimated.

Acoustic Thresholds

We provided discussion of relevant sound thresholds in our *Federal Register* notice of proposed rulemaking (83 FR 9366; March 5, 2018) and do not repeat the information here. Generalized acoustic thresholds based on received level are used to estimate the onset of Level B harassment. These thresholds are 160 dB rms (intermittent sources) and 120 dB rms (continuous sources). Please see Table 3 for Level A harassment (auditory injury) criteria.

Table 3. Exposure Criteria for Auditory Injury.

Hearing Group	Peak pressure ¹	Cumulative sound exposure level ²	
		Impulsive	Non-impulsive

Low-frequency cetaceans	219 dB	183 dB	199 dB
Mid-frequency cetaceans	230 dB	185 dB	198 dB
High-frequency cetaceans	202 dB	155 dB	173 dB
Phocid pinnipeds	218 dB	185 dB	201 dB
Otariid pinnipeds	232 dB	203 dB	219 dB

¹Referenced to 1 μ Pa; unweighted within generalized hearing range

²Referenced to 1 μ Pa²-s; weighted according to appropriate auditory weighting function.

Zones of Ensonification

Sound Propagation – We provided discussion of relevant propagation considerations in our *Federal Register* notice of proposed rulemaking (83 FR 9366; March 5, 2018) and do not repeat the information here. As is common practice in coastal waters, here we assume practical spreading loss (4.5 dB reduction in sound level for each doubling of distance). Practical spreading is a compromise that is often used under conditions where water depth increases as the receiver moves away from the shoreline, resulting in an expected propagation environment that would lie between spherical and cylindrical spreading loss conditions.

Sound Source Levels – We provided discussion of source level considerations in our *Federal Register* notice of proposed rulemaking (83 FR 9366; March 5, 2018) and do not repeat the information here. No changes have been made to the source level selections described in that notice and shown in Table 4.

Table 4. Assumed Source Levels.

Method	Type	Size (in)	SPL (rms) ¹	SPL (peak) ^{1,2}	SEL ^{1,3}
Impact	Plastic	13	156	Not available	Not available
	Timber	12/14	170	Not available	Not available
	Concrete	18	170	184	159
		24	178	189	166
	Steel pipe	12/13	177	192	167
		14	184	200	174
		24	193	210	181
		30	195	216	186
		36	194 (Bangor) 192 (others)	211	181 (Bangor) 184 (others)
Vibratory	Timber	12	153	n/a	n/a

		13/14	155	n/a	n/a
	Steel pipe	13/14	155	n/a	n/a
		16/24	161	n/a	n/a
		30/36	166 (Bangor) 167 (others)	n/a	n/a
	Steel sheet	n/a	163	n/a	n/a

¹Source levels presented at standard distance of 10 m from the driven pile. Peak source levels are not typically evaluated for vibratory pile driving, as they are lower than the relevant thresholds for auditory injury. SEL source levels for vibratory driving are equivalent to SPL (rms) source levels.

The Navy will use bubble curtains when impact driving steel piles of 24-in diameter and greater, except at NBK Bremerton and NBK Keyport (see Mitigation for further discussion). For the reasons described in our *Federal Register* notice of proposed rulemaking (83 FR 9366; March 5, 2018), we assume here that use of the bubble curtain would result in a reduction of 8 dB from the assumed SPL (rms) and SPL (peak) source levels for these pile sizes, and reduce the applied source levels accordingly. For determining distances to the cumulative SEL injury thresholds, auditory weighting functions were applied to the attenuated one-second SEL spectra for steel pipe piles (see Appendix E of the Navy’s application).

Level A Harassment – In order to assess the potential for injury on the basis of the cumulative SEL metric, one must estimate the total strikes per day (impact driving) or the total driving duration per day (vibratory driving). Estimates of total strikes per day and total driving duration per day, shown in Table 5, were described in detail in our notice of proposed rulemaking, and are unchanged (83 FR 9366; March 5, 2018). Table 5 presents an estimate of average strikes per day; average strikes per day and average daily duration values are used in the exposure analyses. For vibratory driving of piles less than 16-in, a daily duration of 0.5 hours was assumed; for vibratory driving of larger piles a daily duration of 2.25 hours was assumed.

Table 5. Estimated Daily Strikes and Driving Duration.

Pile type and method	Installation rate per day	Estimated duration	
		Average strikes/day	Average daily duration
14-in steel; impact	No data	<<1,000 ¹	No data
24- to 30-in steel; impact	1-6	1,000	4.5 minutes to 1.5 hours
18- to 24-in concrete; impact	1-11	4,000 ²	3 minutes to 4 hours

13-in steel; vibratory	2-17	n/a	0-31 minutes ³
24- to 30-in steel; vibratory	1-6	n/a	10 minutes to 4.5 hours ⁴

¹All 14-in piles are expected to be vibratory driven for full embedment depth. In the event that conditions requiring impact driving are encountered, very few strikes are expected to be necessary.

²Estimate based on data from 272 piles installed at NBK Bremerton.

³Estimate based on data from 70 piles installed at NBK Bremerton.

⁴Estimate based on data from 809 piles installed at NBK Bangor. Maximum assumes six piles advanced at a rate of 45 minutes per pile.

Delineation of potential injury zones on the basis of the peak pressure metric was performed using the SPL(peak) values provided in Table 4 above. Source levels for peak pressure are unweighted within the generalized hearing range, while SEL source levels are weighted according to the appropriate auditory weighting function. As discussed in detail in the notice of proposed rulemaking (83 FR 9366; March 5, 2018), delineation of potential injury zones on the basis of the cumulative SEL metric for vibratory driving was performed using the NMFS User Spreadsheet. This relatively simple approach will typically result in higher predicted exposures for broadband sounds, since only one frequency is being considered, compared to exposures associated with the ability to fully incorporate the Technical Guidance's weighting functions.

Because use of the WFA typically results in an overestimate of zone size, the Navy took an alternative approach to delineating potential injury zones for impact driving of 24- and 36-in steel piles and 24-in concrete piles. Note that, because data is not available for all pile sizes and types, we conservatively assume the following in using the available data for 24- and 36-in steel piles and 24-in concrete piles: (1) injury zones for impact driving 14- and 24-in piles are equivalent to the zones for 24-in piles with no bubble curtain; (2) injury zones for impact driving plastic and timber piles and for 18-in concrete piles are equivalent to the zones for 24-in concrete

piles; and (3) injury zones for impact driving 30-in steel piles are equivalent to the zones calculated for 36-in piles (both with and without bubble curtain).

This approach, described in detail in Appendix E of the Navy's application, incorporated frequency weighting adjustments by applying the auditory weighting function over the entire one-second SEL spectral data sets from impact pile driving. If this information for a particular pile size was not available, the next highest source level was used to produce a conservative estimate of areas above threshold values. Sound level measurements from construction activities during the 2011 Test Pile Program at NBK Bangor were used for evaluation of impact-driven steel piles, and sound level measurements from construction activities during the 2015 Intermediate Maintenance Facility Pier 6 Fender Pile Replacement Project at NBK Bremerton were used for evaluation of impact-driven concrete piles.

In consideration of the assumptions relating to propagation, sound source levels, and the methodology applied by the Navy towards incorporating frequency weighting adjustments for delineation of cumulative SEL injury zones for impact driving of steel and concrete piles, notional radial distances to relevant thresholds were calculated (Table 6). However, these distances are sometimes constrained by topography. Actual notional ensonified zones at each facility are shown in Tables 6-1 to 6-6b of the Navy's application. These zones are modeled on the basis of a notional pile located at the seaward end of a given structure in order to provide a conservative estimate of ensonified area.

Table 6. Calculated Distances to Level A Harassment Zones.

Pile	Driver	PW		OW		LF		MF		HF	
		pk	cSEL	pk	cSEL	pk	cSEL	pk	cSEL	pk	cSEL
24-in concrete ¹	Impact	0	34	0	2	0	216	0	3	1	136
24-in steel ²	Impact; BC	1	25	0	1.4	1	136	0	3	10	185
24-in steel ²	Impact; no BC	3	86	0	5	3	159	0	6	34	342
36-in steel ²	Impact; BC	1	158	0	9	1	736	0	10	12	541
36-in steel ²	Impact; no BC	3	736	0	46	3	2,512	1	63	40	2,512
12- to 14-in timber ³	Vibratory	n/a	1	n/a	<1	n/a	2	n/a	<1	n/a	3

16- and 24-in steel ⁴	Vibratory	n/a	7	n/a	1	n/a	12	n/a	1	n/a	17
30- and 36-in steel (Bangor) ⁴	Vibratory	n/a	15	n/a	11	n/a	25	n/a	2	n/a	37
30- and 36-in steel (others) ⁴	Vibratory	n/a	18	n/a	1	n/a	30	n/a	3	n/a	43
Sheet steel ⁴	Vibratory	n/a	10	n/a	1	n/a	16	n/a	1	n/a	24

PW=Phocid; OW=Otariid; LF=low frequency; MF=mid frequency; HF=high frequency; pk=peak pressure; cSEL=cumulative SEL; BC=bubble curtain

¹Assumes 4,000 strikes per day.

²Assumes 1,000 strikes per day. Bubble curtain will be used for 24-, 30-, and 36-in steel piles except at NBK Bremerton and NBK Keyport. Steel piles will not be installed at NBK Manchester.

³Assumes 30 minute daily driving duration.

⁴Assumes 2.25 hour daily driving duration.

Summary – Here, we summarize facility-specific information about piles to be removed and installed. In general, it is likely that pile removals may be accomplished via a combination of methods (e.g., vibratory driver, cut at mudline, direct pull). However, for purposes of analysis we assume that all removals would be via vibratory driver. In addition, we assume that installation of all steel piles larger than 14-in would require use of both impact and vibratory drivers, although it is likely that some of these piles would be installed solely via use of the vibratory driver. All concrete, timber, and plastic piles would be installed solely via impact driver. Steel sheet piles and steel pipe piles of 14-in diameter and smaller would be installed solely via vibratory driver. All piles removed are assumed to be replaced at a 1:1 ratio, although it is likely that a lesser number of replacement piles would be required. For full details, please see Appendix A of the Navy's application.

- NBK Bangor: The Navy anticipates ongoing maintenance work at the older Explosives Handling Wharf (EHW-1), including removal and replacement of up to 44 piles. Replacement of up to 75 piles is anticipated for contingency repairs at any existing structure. Piles to be removed would be steel, timber, and/or concrete, and replacement piles would be steel

and/or concrete. As a conservative scenario, all piles are assumed to be 36-in steel for purposes of analysis.

- Zelatched Point: Replacement of up to 20 piles is anticipated for contingency repairs. Piles to be removed would be 12-in timber piles, while replacement piles could be steel, timber, and/or concrete. As a conservative scenario, all replacement piles are assumed to be 36-in steel for purposes of analysis.

- NBK Bremerton: The Navy anticipates ongoing maintenance work at multiple existing structures. At Pier 5, 360 timber fender piles would be removed and replaced with concrete piles. Timber piles are assumed to be 14-in diameter, and concrete piles are assumed to be 24-in. At Pier 4, 80 timber fender piles would be replaced with steel piles—timber and steel piles are assumed to be 14-in diameter. Anticipated repairs to other piers would require removal of up to 20 timber piles, followed by installation of steel sheet piles. Replacement of up to 75 piles is anticipated for contingency repairs at any existing structure. Piles to be removed would be steel and/or timber, and replacement piles would be 24-in concrete. The largest estimated Level B harassment zone of influence (ZOI) results from vibratory driving of sheet piles, which is expected to occur for only twenty of the estimated total of 168 activity days. The Navy has elected to assume this largest estimated ZOI for all 168 activity days as a conservative scenario.

- NBK Keyport: Replacement of up to 20 piles is anticipated for contingency repairs. Piles to be removed would be steel and/or concrete (up to 18-in), while replacement piles would be steel. As a conservative scenario, all replacement piles are assumed to be 36-in steel for purposes of analysis.

- NBK Manchester: Replacement of up to 50 piles is anticipated for contingency repairs. Piles to be removed would be timber and/or plastic (up to 18-in), while replacement piles

could be timber, plastic, and/or concrete. As a conservative scenario, all replacement piles are assumed to be 24-in concrete for purposes of analysis.

- NS Everett: The Navy anticipates minor repairs at the North Wharf, requiring replacement of two concrete piles (assumed to be 24-in). Replacement of up to 76 piles is anticipated for contingency repairs. Piles to be removed would include one steel pile and 75 timber piles. The one steel pile would be replaced by a 36-in steel pile, while the timber piles could be replaced by concrete and/or timber piles. As a conservative scenario, these replacement piles are assumed to be 24-in concrete for purposes of analysis.

Level B harassment zones and associated areas of ensonification are identified in Table 7 below. Although not all zones are applied to the exposure analysis, these may be effected as part of the required monitoring. Ensonified areas vary based on topography in the vicinity of the facility and are provided for each relevant facility.

Table 7. Radial Distances to Relevant Behavioral Isopleths and Associated Ensonified Areas.

Pile Size and Type	Impact (160-dB rms) ¹	Ensonified Area ²	Vibratory (120-dB) ³	Ensonified Area ²
Plastic (13-in)	5	0.001	n/a	n/a
Timber (12-in)	46	0.01	1.6	3.8 (Manchester Finger Pier) 4.6 (Manchester Fuel Pier)
Timber (13/14-in) ⁴	46	0.01	2.2	6.8 (Bremerton) 5.9 (Manchester Finger Pier) 7.8 (Manchester Fuel Pier) ⁶ 9.4 (Everett)
Concrete (24-in) ⁴	159	0.08	n/a	n/a
Steel (14-in)	398	0.5 (Bremerton)	2.2	6.8 (Bremerton)
Steel (24-in; BC)	464	0.54 (Bangor) 0.48 (Zelatched Point)	n/a	n/a
Steel (24-in; no BC) ⁵	1,585	2.09 (Keyport)	5.4	26.8 (Bangor) 4.9 (Keyport) 37.9 (Zelatched Point)
Steel (30-in; BC)	631	0.91 (Bangor) 0.85 (Zelatched Point) 1.2 (Everett)	n/a	n/a
Steel (30-in; no BC)	2,154	1.94 (Keyport)	Same as 36-in	Same as 36-in
Steel (36-in; BC)	541 (Bangor) 398 (others)	0.7 (Bangor) 0.36 (Zelatched Point) 0.5 (Everett)	n/a	n/a
Steel (36-in; no BC)	1,359	0.42 (Keyport)	11.7 (Bangor) 13.6 (others)	4.9 (Keyport) 75.24 (Zelatched Point)

				117.8 (Everett) 40.9 (Bangor)
Sheet steel	n/a	n/a	7.4	15.0 (Bremerton)

BC=bubble curtain

¹Radial distance to threshold in meters.

²Ensonified area in square kilometers.

³Radial distance to threshold in kilometers.

⁴Zones for impact driving of 18-in concrete piles are equivalent to those for impact driving of timber piles. Zones for vibratory removal of up to 18-in diameter plastic/timber piles are assumed to be equivalent to those for 13/14-in timber piles.

⁵Zones for vibratory driving of 16-in steel piles assumed equivalent to those for 24-in steel piles.

⁶Worst-case values for vibratory extraction of timber/plastic piles at NBK Manchester, where piles to be removed are a maximum 18-in diameter.

Marine Mammal Occurrence

Available information regarding marine mammal occurrence in the vicinity of the six installations includes density information aggregated in the Navy's Marine Mammal Species Density Database (NMSDD; Navy, 2015) or site-specific survey information from particular installations (e.g., local pinniped counts). More recent density estimates for harbor porpoise are available in Smultea *et al.* (2017). First, for each installation we describe anticipated frequency of occurrence and the information deemed most appropriate for the exposure estimates. For all facilities, large whales (humpback whale, minke whale, and gray whale), killer whales (transient and resident), and the elephant seal are considered as occurring only rarely and unpredictably, on the basis of past sighting records. For these species, average group size is considered in concert with expected frequency of occurrence to develop the most realistic exposure estimate. Although certain species are not expected to occur at all at some facilities—for example, resident killer whales are not expected to occur in Hood Canal—the Navy has developed an overall take estimate and request for these species that would apply to activities occurring over the 5-year duration at all six installations.

- NBK Bangor: In addition to the species described above, the Dall's porpoise is considered as a rare, unpredictably occurring species. A density-based analysis is used for the harbor porpoise, while data from site-specific abundance surveys is used for the California sea lion, Steller sea lion, and harbor seal.
- Zelatched Point: In addition to the species described above, the Dall's porpoise is considered as a rare, unpredictably occurring species. A density-based analysis is used for the harbor porpoise, California sea lion, Steller sea lion, and harbor seal.
- NBK Bremerton: A density-based analysis is used for the harbor porpoise, Dall's porpoise, and Steller sea lion, while data from site-specific abundance surveys is used for the California sea lion and harbor seal.
- NBK Keyport: A density-based analysis is used for the harbor porpoise, Dall's porpoise, California sea lion, Steller sea lion, and harbor seal.
- NBK Manchester: A density-based analysis is used for the harbor porpoise, Dall's porpoise, and harbor seal, while data from site-specific abundance surveys is used for the California sea lion and Steller sea lion.
- NS Everett: A density-based analysis is used for the harbor porpoise, Dall's porpoise, and Steller sea lion, while data from site-specific abundance surveys is used for the California sea lion and harbor seal.

Table 8. Marine Mammal Densities.

Species	Region	Density (June-February)
Harbor porpoise	Hood Canal (Bangor, Zelatched Point)	0.44
	East Whidbey (Everett)	0.75
	Bainbridge (Bremerton, Keyport)	0.53
	Vashon (Manchester)	0.25
Dall's porpoise	Puget Sound	0.039
Steller sea lion	Puget Sound	0.0368
	Dabob Bay	0.0251
California sea lion	Puget Sound	0.1266
	Dabob Bay	0.279

Harbor seal	Everett	2.2062
	Keyport/Manchester	1.219
	Dabob Bay	9.918

Sources: Navy, 2015; Smultea *et al.*, 2017 (harbor porpoise)

Exposure Estimates

To quantitatively assess exposure of marine mammals to noise from pile driving activities, we use three methods, determined by the species' spatial and temporal occurrence. For species with rare or infrequent occurrence at a given installation during the in-water work window, the likelihood of interaction was reviewed on the basis of past records of occurrence (described in detail in our *Federal Register* notice of proposed rulemaking (83 FR 9366; March 5, 2018)) and the potential maximum duration of work days at each installation, as well as total work days for all installations. Occurrence of the species in this category (i.e., large whales, killer whales, elephant seal (all installations), and Dall's porpoise (Hood Canal)) would not be anticipated to extend for multiple days. For the large whales and killer whales, the duration of occurrence was set to two days, expected to be roughly equivalent to one transit in the vicinity of a project site. The calculation for species with rare or infrequent occurrence is:

$$\text{Exposure estimate} = \text{expected group size} \times \text{probable duration}$$

For species that occur regularly but for which site-specific abundance information is not available, density estimates (Table 8) were used to determine the number of animals potentially exposed on any one day of pile driving or extraction. The calculation for density-based analysis of species with regular occurrence is:

$$\text{Exposure estimate} = N (\text{density}) \times \text{ZOI (area)} \times \text{maximum days of pile driving}$$

For remaining species, site-specific abundance information (i.e., average monthly maximum over the time period when pile driving will occur) was used:

$$\text{Exposure estimate} = \text{Abundance} \times \text{maximum days of pile driving}$$

Large Whales – For each species of large whale (i.e., humpback whale, minke whale, and gray whale), we assume rare and infrequent occurrence at all installations. For all three species, if observed, they typically occur singly or in pairs. Therefore, for all three species, we assume that a pair of whales may occur in the vicinity of an installation for a total of two days. We do not expect that this would happen multiple times, and cannot predict where such an occurrence may happen, so would authorize a total of four takes by Level B harassment of each species in total for the 5-year duration (across all installations).

It is important to note that the Navy will implement a shutdown of pile driving activity if any large whale is observed within any defined harassment zone (see Mitigation section below). Therefore, the take number is intended to provide insurance against the event that whales occur within Level B harassment zones that cannot be fully observed by monitors. As a result of this mitigation, we do not believe that Level A harassment is a likely outcome upon occurrence of any large whale. While the calculated Level A harassment zone is as large as 2.5 km for impact driving of 36-in steel piles without a bubble curtain (ranging from 136-736 m for other impact driving scenarios), this requires that a whale be present at that range for the full assumed duration of 1,000 pile strikes (expected to require 1.5 hours). Given the Navy's commitment to shut down upon observation of a large whale, and the likelihood that the presence of a large whale in the vicinity of any Navy installation would be known due to reporting via Orca Network (see Monitoring and Reporting), we do not expect that any whale would be present within a Level A harassment zone for sufficient duration to actually experience permanent threshold shift (PTS).

Killer Whales – For killer whales, the take number is derived via the same process described above for large whales. For transient killer whales, we assume an average group size

of six whales occurring for a period of two days. The resulting total take number of 12 would also account for the low probability that a larger group occurred once. For resident killer whales, we assume an average group size of 20 whales occurring for two days. This is equivalent to the expected pod size for J pod, which is most likely to occur in the vicinity of Navy installations, but would also account for the unlikely occurrence of L pod (with a size of approximately 40 whales) once in the vicinity of any Navy installation.

As with large whales, the Navy will implement shutdown of pile driving activity at any time that any killer whale is observed within any calculated harassment zone. We expect this to minimize the extent and duration of any Level B harassment. Given the small size of calculated Level A harassment zones—maximum of 63 m for the worst-case scenario of impact-driven 36-in steel piles with no bubble curtain, other scenarios range from 1-10 m—we do not anticipate any potential for Level A harassment of killer whales.

Dall's Porpoise – Using the density given in Table 8, the largest appropriate ZOI for each of the four installations in Puget Sound, and the number of days associated with each of these installations (as indicated in harbor porpoise section below), the total estimated exposure of Dall's porpoises above Level B harassment thresholds is 146. Dall's porpoises are not expected to occur in Hood Canal. Dall's porpoises are not expected to occur frequently in the vicinity of Navy installations and have not been reported in recent years. This total take authorization number (146) is applied to all installations over the 5-year duration.

The Navy will implement shutdown of pile driving activity at any time if a Dall's porpoise is observed in any harassment zone. Therefore, the take estimate is precautionary in accounting for potential occurrence in areas that cannot be visually observed or in the event that porpoises appear within Level B harassment zones before shutdown can be implemented. As was

described for large whales, as a result of this mitigation, we do not believe that Level A harassment is a likely outcome. While the calculated Level A harassment zone is as large as 2.5 km for impact driving of 36-in steel piles without a bubble curtain (ranging from 136-541 m for other impact driving scenarios), this requires that a porpoise be present at that range for the full assumed duration of 1,000 pile strikes (expected to require 1.5 hours). Given the Navy's commitment to shut down upon observation of a porpoise, and the likelihood that a porpoise would engage in aversive behavior prior to experiencing PTS, we do not expect that any porpoise would be present within a Level A harassment zone for sufficient duration to actually experience PTS.

Harbor Porpoise – Level B harassment estimates for harbor porpoise were calculated for each installation using the appropriate density given in Table 8, the largest appropriate ZOI for each installation, and the appropriate number of days.

- NBK Bangor: Using the Hood Canal sub-region density, 119 days of pile driving, and the largest ZOI calculated for pile driving at this location (40.9 km² for vibratory installation of 30- or 36-in steel piles) produces an estimate of 2,142 incidents of Level B harassment exposure for harbor porpoise.

- Zelatched Point: Using the Hood Canal sub-region density, 20 days of pile driving, and the largest ZOI calculated for pile driving at this location (75.24 km² for vibratory installation of 30- or 36-in steel piles) produces an estimate of 662 incidents of Level B harassment exposure for harbor porpoise.

- NBK Bremerton: Using the Bainbridge sub-region density, 168 days of pile driving, and the largest ZOI calculated for pile driving at this location (15 km² for vibratory

installation of sheet steel piles) produces an estimate of 1,336 incidents of Level B harassment exposure for harbor porpoise.

- NBK Keyport: Using the Bainbridge sub-region density, 20 days of pile driving, and the largest ZOI calculated for pile driving at this location (4.9 km² for vibratory installation of 30- or 36-in steel piles) produces an estimate of 52 incidents of Level B harassment exposure for harbor porpoise.

- NBK Manchester: Using the Vashon sub-region density, 50 days of pile driving, and the largest ZOI calculated for vibratory removal of timber piles (7.8 km² for vibratory extraction of timber piles) produces an estimate of 98 incidents of Level B harassment exposure for harbor porpoise.

- NS Everett: Using the East Whidbey sub-region density, 78 days of pile driving, and the largest ZOI calculated for vibratory extraction of timber piles (9.4 km²) produces an estimate of 552 incidents of Level B harassment exposure for harbor porpoise. Although some vibratory installation is anticipated for a single steel pile, we anticipate this would occur for only a brief period. Therefore, use of the assumed zone for vibratory extraction of timber piles is appropriate in accounting for reasonably expected marine mammal exposure at this location.

The Navy will implement shutdown of pile driving activity at any time if a harbor porpoise is observed in any harassment zone. Therefore, the take estimate is precautionary in accounting for potential occurrence in areas that cannot be visually observed or in the event that porpoises appear within Level B harassment zones before shutdown can be implemented. As was described for large whales, as a result of this mitigation, we do not believe that Level A harassment is a likely outcome. While the calculated Level A harassment zone is as large as 2.5 km for impact driving of 36-in steel piles without a bubble curtain (ranging from 136-541 m for

other impact driving scenarios), this requires that a porpoise be present at that range for the full assumed duration of 1,000 pile strikes (expected to require 1.5 hours). Given the Navy's commitment to shut down upon observation of a porpoise, and the likelihood that a porpoise would engage in aversive behavior prior to experiencing PTS, we do not expect that any porpoise would be present within a Level A harassment zone for sufficient duration to actually experience PTS.

Steller Sea Lion – Level B harassment exposure estimates for Steller sea lions were calculated for each installation using the appropriate density given in Table 8 or site-specific abundance, the largest appropriate ZOI for each installation, and the appropriate number of days. Additional detail regarding site-specific abundance information was provided in our *Federal Register* notice of proposed rulemaking (83 FR 9366; March 5, 2018).

- NBK Bangor: The average of the monthly maximum counts during the in-water work window provides an estimate of three Steller sea lions present per day. Using this value for 119 days results in an estimate of 357 incidents of Level B harassment exposure.
- Zelatched Point: Using the Dabob Bay density value (Table 8), 20 days of pile driving, and the largest ZOI calculated for pile driving at this location (75.24 km² for vibratory installation of 30- or 36-in steel piles) produces an estimate of 38 incidents of Level B harassment exposure for Steller sea lions.
- NBK Bremerton: Using the Puget Sound density value (Table 8), 168 days of pile driving, and the largest ZOI calculated for pile driving at this location (15 km² for vibratory installation of sheet steel piles) produces an estimate of 93 incidents of Level B harassment exposure for Steller sea lions.

- NBK Keyport: Using the Puget Sound density value (Table 8), 20 days of pile driving, and the largest ZOI calculated for pile driving at this location (4.9 km² for vibratory installation of 30- or 36-in steel piles) produces an estimate of four incidents of Level B harassment exposure for Steller sea lions.

- NBK Manchester: Site-specific occurrence data indicate that 10 Steller sea lions may be present on any given day. Using this average value for 50 days results in an estimate of 500 incidents of Level B harassment exposure.

- NS Everett: Using the Puget Sound density value (Table 8), 78 days of pile driving, and the largest ZOI calculated for this location (9.4 km²) produces an estimate of 27 incidents of Level B exposure for Steller sea lion.

Given the small size of calculated Level A harassment zones—maximum of 43 m for the worst-case scenario of impact-driven 36-in steel piles with no bubble curtain, other scenarios range from 1-11 m—we do not anticipate any potential for Level A harassment of Steller sea lions.

California Sea Lions – Level B harassment exposure estimates for California sea lions were calculated for each installation using the appropriate density given in Table 8 or site-specific abundance, the largest appropriate ZOI for each installation, and the appropriate number of days. Additional detail regarding site-specific abundance information was provided in our *Federal Register* notice of proposed rulemaking (83 FR 9366; March 5, 2018).

- NBK Bangor: The average of the monthly maximum counts during the in-water work window provides an estimate of 49 California sea lions per day. Using this value for 119 days results in an estimate of 5,831 incidents of Level B harassment exposure.

- Zelatched Point: Using the Dabob Bay density value (Table 8), 20 days of pile driving, and the largest ZOI calculated for pile driving at this location (75.24 km² for vibratory installation of 30- or 36-in steel piles) produces an estimate of 420 incidents of Level B harassment exposure for California sea lions.
- NBK Bremerton: The average of the monthly maximum counts during the in-water work window provides an estimate of 69 California sea lions per day. Using this value for 168 days results in an estimate of 11,592 incidents of Level B harassment exposure.
- NBK Keyport: Using the Puget Sound density value (Table 8), 20 days of pile driving, and the largest ZOI calculated for pile driving at this location (4.9 km² for vibratory installation of 30- or 36-in steel piles) produces an estimate of 12 incidents of Level B harassment exposure for California sea lions.
- NBK Manchester: Site-specific occurrence data indicate that 43 California sea lions may be present on any given day. Using this average value for 50 days results in an estimate of 2,150 incidents of Level B harassment exposure.
- NS Everett: The average of the monthly maximum counts during the in-water work window provides an estimate of 66 California sea lions per day. Using this value for 78 days results in an estimate of 5,148 incidents of Level B harassment exposure.

Given the small size of calculated Level A harassment zones—maximum of 43 m for the worst-case scenario of impact-driven 36-in steel piles with no bubble curtain, other scenarios range from 1-11 m—we do not anticipate any potential for Level A harassment of California sea lions.

Harbor Seal – Harbor seals are expected to occur year-round at all installations, with the greatest numbers expected at installations with nearby haul-out sites. Level B harassment

exposure estimates for harbor seals were calculated for each installation using the appropriate density given in Table 8 or site-specific abundance, the largest appropriate ZOI for each installation, and the appropriate number of days. Additional detail regarding site-specific abundance information was provided in our *Federal Register* notice of proposed rulemaking (83 FR 9366; March 5, 2018).

Harbor seals are expected to be the most abundant marine mammal at all installations, often occurring in and around existing in-water structures in a way that may restrict observers' ability to adequately observe seals and subsequently implement shutdowns. In addition, the calculated Level A harassment zones are significantly larger than those for sea lions, which may also be abundant at various installations at certain times of year. For harbor seals, the largest calculated Level A harassment zone is 736 m (compared with a maximum zone of 43 m for sea lions), calculated for the worst-case scenario of impact-driven 36-in steel piles without use of the bubble curtain. Other scenarios range from 25-158 m. Therefore, we assume that some Level A harassment is likely to occur for harbor seals and provide installation-specific estimates below.

- NBK Bangor: Site-specific occurrence data indicate that as many as 28 harbor seals hauled out per day under Marginal Wharf (or were observed swimming in adjacent waters). Assuming a few other individuals may be present elsewhere on the Bangor waterfront, we estimate that 35 harbor seals may be present per day near the installation during summer and early fall, which are expected to be months with greatest abundance of seals. Using this value for 119 days results in an estimate of 4,165 incidents of Level B harassment exposure.

Considering the largest Level A harassment zone expected to typically occur at NBK Bangor (158 m), and assuming as a precaution that one seal per day could remain within the calculated zone for a sufficient period to accumulate enough energy to result in PTS, we estimate

119 incidents of take by Level A harassment. It is important to note that the estimate of potential Level A harassment for NBK Bangor is expected to be an overestimate, as planned projects are not expected to occur near Marginal Wharf—the location where most harbor seal activity occurs.

- Zelatched Point: Using the Dabob Bay density value (Table 8), 20 days of pile driving, and the largest ZOI calculated for pile driving at this location (75.24 km^2 for vibratory installation of 30- or 36-in steel piles) produces an estimate of 14,925 incidents of Level B harassment exposure for harbor seals. The largest calculated Level A harassment zone at Zelatched Point would be 158 m. However, because harbor seals are not known to haul out or congregate in the vicinity of in-water structures, as is the case at NBK Bangor, we do not anticipate that Level A harassment will occur at Zelatched Point and will not authorize such take.

- NBK Bremerton: Site-specific occurrence data indicate that approximately 11 harbor seals may be present per day. Using this value for 168 days results in an estimate of 1,848 incidents of Level B harassment exposure. The largest Level A harassment zone at NBK Bremerton would be 86 m and, given the lack of regular presence of harbor seals in close proximity to existing in-water structures, we do not anticipate that Level A harassment will occur at NBK Bremerton and will not authorize such take.

- NBK Keyport: No harbor seal haul-outs have been identified at this installation. Using the Puget Sound density value (Table 8), 20 days of pile driving, and the largest ZOI calculated for pile driving at this location (4.9 km^2 for vibratory installation of 30- or 36-in steel piles) produces an estimate of 119 incidents of Level B harassment exposure for harbor seals. Given the lack of haul-outs and of regular harbor seal presence at this installation, we do not anticipate that Level A harassment will occur at NBK Keyport and will not authorize such take.

- NBK Manchester: No harbor seal haul-outs have been identified at this installation. Using the appropriate density value (Table 8), 50 days of pile driving, and the largest ZOI calculated for vibratory extraction of timber piles (7.8 km^2) produces an estimate of 477 incidents of Level B harassment exposure for harbor seals. Given the lack of haul-outs and of regular harbor seal presence at this installation, we do not anticipate that Level A harassment will occur at NBK Manchester and will not authorize such take.

- NS Everett: The average of the monthly maximum counts during the in-water work window provides an estimate of 212 seals per day. Using this value for 78 days results in an estimate of 16,536 incidents of Level B harassment exposure.

The largest Level A harassment zone calculated for NS Everett (158 m) would occur for only one day during impact driving of the single 36-in steel pile. During the remainder of pile driving at this installation, the largest Level A harassment zone would be 34 m (impact driving of 24-in concrete piles). Given the abundant seal population at this site, we assume that some portion of the seal population may be present and unobserved within these zones for a sufficient period to accumulate enough energy to result in PTS. For the larger zone, we assume that 11 seals (five percent of animals present) may occur within the Level A harassment zone for such a duration, while for the smaller zone associated with concrete piles, we assume that two seals (one percent of animals present) of the population may occur within the zone for such a duration. Therefore, we estimate a total number of 165 incidents of take by Level A harassment (i.e., two seals on each of the 77 concrete pile driving days in addition to 11 seals on the one day on which a steel pile would be installed).

Northern Elephant Seal – Northern elephant seals are considered rare visitors to Puget Sound. However, solitary juvenile elephant seals have been known to sporadically haul out to

molt in Puget Sound during spring and summer months. Because there are occasional sightings in Puget Sound, we reason that exposure of up to one seal to noise above Level B harassment thresholds could occur for a two-day duration. This event could occur at any installation over the 5-year duration of these regulations.

The total amount of take by Level B harassment that may be authorized for all species and installations is summarized in Table 9 below. Take by Level A harassment may be authorized only for harbor seals occurring at NBK Bangor and NS Everett (a total of 284 such incidents, as detailed above).

Table 9. Estimated Take by Level B Harassment

Species	Bangor	Zelatched Point	Bremerton	Keyport	Manchester	Everett	Total	Percent ¹
Humpback whale	Applies across all installations						4	0.2
Minke whale	Applies across all installations						4	0.02
Gray whale	Applies across all installations						4	0.6
Killer whale (transient)	Applies across all installations						12	4.9
Killer whale (resident)	Applies across all installations						40	48.2
Dall's porpoise	Applies across all installations						146	0.6
Harbor porpoise	2,142	662	1,336	52	98	552	4,842	43.1
Steller sea lion	357	38	93	4	500	27	1,019	2.4
California sea lion	5,831	420	11,592	12	2,150	5,148	25,153	8.5
Harbor seal	4,680	14,925	1,848	119	477	16,536	38,585	n/a
Elephant seal	Applies across all installations						2	0.001

¹Please see Small Numbers Analysis for more details about these percentages.

Mitigation

Under Section 101(a)(5)(A) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to such activity, and other means of effecting the least practicable adverse impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for taking for certain subsistence uses (“least practicable adverse impact”). NMFS does not have a regulatory definition for “least practicable adverse impact.” However, NMFS’s implementing regulations require applicants for incidental take authorizations to include information about the

availability and feasibility (economic and technological) of equipment, methods, and manner of conducting such activity or other means of effecting the least practicable adverse impact upon the affected species or stocks and their habitat (50 CFR 216.104(a)(11)).

In evaluating how mitigation may or may not be appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, we carefully consider two primary factors:

(1) The manner in which, and the degree to which, implementation of the measure(s) is expected to reduce impacts to marine mammal species or stocks, their habitat, and their availability for subsistence uses. This analysis will consider such things as the nature of the potential adverse impact (such as likelihood, scope, and range), the likelihood that the measure will be effective if implemented, and the likelihood of successful implementation.

(2) The practicability of the measure for applicant implementation. Practicability of implementation may consider such things as cost, impact on operations, personnel safety, and practicality of implementation.

The mitigation strategies described below largely follow those required and successfully implemented under previous incidental take authorizations issued in association with similar construction activities. Measurements from similar pile driving events were coupled with practical spreading loss and other relevant information to estimate ZOIs (see “Estimated Take”); these ZOI values were used to develop mitigation measures for pile driving activities at the six installations. Background discussion related to underwater sound concepts and terminology was provided in our *Federal Register* notice of proposed rulemaking (83 FR 9366; March 5, 2018). The ZOIs were used to inform the mitigation zones that would be established to prevent Level A

harassment and to minimize Level B harassment for all cetacean species, while providing estimates of the areas within which Level B harassment might occur.

During installation of steel piles, the Navy will use vibratory driving to the maximum extent practicable. In addition to the specific measures described later in this section, the Navy will conduct briefings for construction supervisors and crews, the marine mammal monitoring team, and Navy staff prior to the start of all pile driving activity, and when new personnel join the work, in order to explain responsibilities, communication procedures, the marine mammal monitoring protocol, and operational procedures. Other mitigation requirements committed to by the Navy but not relating to marine mammals (e.g., construction best management practices) are described in section 11 of the Navy's application.

Timing

As described previously, the Navy will adhere to in-water work windows designed for the protection of fish. These timing windows would also benefit marine mammals by limiting the annual duration of construction activities. At NBK Bangor and Zelatched Point, the Navy will adhere to a July 16 through January 15 window, while at the remaining facilities this window is extended to February 15.

On a daily basis, in-water construction activities will occur only during daylight hours (sunrise to sunset) except from July 16 to September 15 when impact pile driving will only occur starting two hours after sunrise and ending two hours before sunset in order to protect marbled murrelets (*Brachyramphus marmoratus*) during the nesting season.

Monitoring and Shutdown for Pile Driving

The following measures apply to the Navy's mitigation through shutdown and disturbance zones:

Shutdown Zone – The purpose of a shutdown zone is to define an area within which shutdown of activity would occur upon sighting of a marine mammal (or in anticipation of a marine mammal entering the defined area), thus preventing some undesirable outcome, such as auditory injury or behavioral disturbance of sensitive species (serious injury or death are unlikely outcomes even in the absence of mitigation measures). For all pile driving activities, the Navy will establish a minimum shutdown zone with a radial distance of 10 m. This minimum zone is intended to prevent the already unlikely possibility of physical interaction with construction equipment and to establish a precautionary minimum zone with regard to acoustic effects.

Relevant information regarding Level A harassment zones was provided in Tables 3-5 and calculated isopleth distances were provided in Table 6. In many cases, especially for vibratory driving, the minimum shutdown zone of 10 m is expected to contain the area in which auditory injury could occur. In all circumstances where the predicted Level A harassment zone exceeds the minimum zone, the Navy shall implement a shutdown zone equal to the predicted Level A harassment zone (see Table 6). In addition, the Navy will implement shutdown upon observation of any cetacean within a calculated Level B harassment zone (see Table 7).

Disturbance Zone – Disturbance zones are the areas in which sound pressure levels equal or exceed 160 and 120 dB rms (for impact and vibratory pile driving, respectively). Disturbance zones provide utility for monitoring conducted for mitigation purposes (*i.e.*, shutdown zone monitoring) by establishing monitoring protocols for areas adjacent to the shutdown zones and, as noted above, the disturbance zones act as de facto shutdown zones for cetaceans. Monitoring of disturbance zones enables observers to be aware of and communicate the presence of marine mammals in the project area but outside the shutdown zone, and thus prepare for potential shutdowns of activity. For cetaceans, the Navy will implement shutdowns upon observation of

any cetacean within a disturbance zone (while acknowledging that some disturbance zones are too large to practicably monitor)—these will also be recorded as incidents of harassment. For pinnipeds, the primary purpose of disturbance zone monitoring is for documenting incidents of Level B harassment; disturbance zone monitoring is discussed in greater detail later (see “Monitoring and Reporting”). Nominal radial distances for disturbance zones are shown in Table 7.

In order to document observed incidents of harassment, monitors record all marine mammal observations, regardless of location. The observer’s location and the location of the pile being driven will be known, and the location of the animal may be estimated as a distance from the observer and then compared to the location from the pile. It may then be estimated whether the animal was exposed to sound levels constituting incidental harassment on the basis of predicted distances to relevant thresholds in post-processing of observational data, and a precise accounting of observed incidents of harassment created. This information may then be used to extrapolate observed takes to reach an approximate understanding of actual total takes, in cases where the entire zone was not monitored.

Monitoring Protocols – Monitoring will be conducted before, during, and after pile driving activities. In addition, observers will record all incidents of marine mammal occurrence, regardless of distance from activity, and monitors will document any behavioral reactions in concert with distance from piles being driven. Observations made outside the shutdown zone will not result in shutdown; that pile segment will be completed without cessation, unless the animal approaches or enters the shutdown zone, at which point all pile driving activities would be halted. Monitoring will take place from 15 minutes prior to initiation through 30 minutes post-completion of pile driving activities. Pile driving activities include the time to install or remove a

single pile or series of piles, as long as the time elapsed between uses of the pile driving equipment is no more than 30 minutes.

Prior to the start of pile driving on any day, the Navy will contact and/or review the latest sightings data from the Orca Network and/or Center for Whale Research to determine the location of the nearest marine mammal sightings. The Orca Sightings Network consists of a list of over 600 residents, scientists, and government agency personnel in the United States and Canada, and includes passive acoustic detections. The presence of a killer whale in the vicinity of any of the six installations would likely be a notable event, drawing public attention and media scrutiny. With this level of coordination in the region of activity, the Navy should be able to effectively receive real-time information on the presence or absence of whales, sufficient to inform the day's activities. Pile driving will not occur if there is a risk of incidental harassment of a southern resident killer whale.

The following additional measures apply to visual monitoring:

(1) Monitoring will be conducted by qualified, trained protected species observers, who will be placed at the best vantage point(s) practicable (i.e., from a small boat, construction barges, on shore, or any other suitable location) to monitor for marine mammals and implement shutdown/delay procedures when applicable by calling for the shutdown to the hammer operator. Observers shall have no other construction-related tasks while conducting monitoring. Observers should have the following minimum qualifications:

- Visual acuity in both eyes (correction is permissible) sufficient for discernment of moving targets at the water's surface with ability to estimate target size and distance; use of binoculars may be necessary to correctly identify the target;

- Ability to conduct field observations and collect data according to assigned protocols;
- Experience or training in the field identification of marine mammals, including the identification of behaviors;
- Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;
- Writing skills sufficient to document observations including, but not limited to: the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates and times when in-water construction activities were suspended to avoid potential incidental injury of marine mammals from construction noise within a defined shutdown zone; and marine mammal behavior; and
- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary.

Observer teams employed by the Navy in satisfaction of the mitigation and monitoring requirements described herein must meet the following additional requirements:

- Independent observers (i.e., not construction personnel) are required.
- At least one observer must have prior experience working as an observer.
- Other observers may substitute education (degree in biological science or related field) or training for experience.
- Where a team of three or more observers are required, one observer should be designated as lead observer or monitoring coordinator. The lead observer must have prior experience working as an observer.

(2) Prior to the start of pile driving activity, the shutdown zone will be monitored for 15 minutes to ensure that it is clear of marine mammals. Pile driving will only commence once observers have declared the shutdown zone clear of marine mammals; marine mammals will be allowed to remain in the shutdown zone (*i.e.*, must leave of their own volition), and their behavior will be monitored and documented. The shutdown zone may only be declared clear, and pile driving started, when the entire shutdown zone is visible (*i.e.*, when not obscured by dark, rain, fog, etc.). In addition, if such conditions should arise during impact pile driving that is already underway, the activity will halt.

(3) If a marine mammal approaches or enters the shutdown zone during the course of pile driving operations, activity will be halted and delayed until either the animal has voluntarily left and been visually confirmed beyond the shutdown zone or fifteen minutes have passed without re-detection of the animal. Monitoring will be conducted throughout the time required to drive a pile and for thirty minutes following the conclusion of pile driving.

Soft Start

The use of a soft start procedure is believed to provide additional protection to marine mammals by warning marine mammals or providing them with a chance to leave the area prior to the hammer operating at full capacity, and typically involves a requirement to initiate sound from the hammer at reduced energy followed by a waiting period. This procedure is repeated two additional times. It is difficult to specify the reduction in energy for any given hammer because of variation across drivers and, for impact hammers, the actual number of strikes at reduced energy will vary because operating the hammer at less than full power results in “bouncing” of the hammer as it strikes the pile, resulting in multiple “strikes.” The Navy will utilize soft start techniques for impact pile driving. We require an initial set of three strikes from the impact

hammer at reduced energy, followed by a 30-second waiting period, then 2 subsequent 3-strike sets. Soft start will be required at the beginning of each day's impact pile driving work and at any time following a cessation of impact pile driving of thirty minutes or longer; the requirement to implement soft start for impact driving is independent of whether vibratory driving has occurred within the prior 30 minutes.

Bubble Curtain

Sound levels can be greatly reduced during impact pile driving using sound attenuation devices, including bubble curtains, which create a column of air bubbles rising around a pile from the substrate to the water surface. The air bubbles absorb and scatter sound waves emanating from the pile, thereby reducing the sound energy. Bubble curtains may be confined or unconfined. Cushion blocks are also commonly used by construction contractors in order to protect equipment and the driven pile; use of cushion blocks typically reduces emitted sound pressure levels to some extent.

The literature presents a wide array of observed attenuation results for bubble curtains (see Appendix B of the Navy's application). The variability in attenuation levels is due to variation in design, as well as differences in site conditions and difficulty in properly installing and operating in-water attenuation devices. As a general rule, reductions of greater than 10 dB cannot be reliably predicted. Prior monitoring by the Navy during a project at NBK Bangor reported a range of measured values for realized attenuation mostly within 6 to 12 dB, but with an overall average of 9 dB in effective attenuation (Illingworth and Rodkin, 2012).

The Navy will use a bubble curtain during impact driving of all steel piles greater than 14-in diameter in water depths greater than 2 ft (0.67 m), except at NBK Bremerton and Keyport. Bubble curtains will not be used during impact driving of smaller steel piles or other pile types

due to the relatively low source levels, as the requirement to deploy the curtain system at each driven pile results in a significantly lower production rate. Where a bubble curtain is used, the contractor will be required to turn it on prior to the soft start in order to flush fish from the area closest to the driven pile.

Bubble curtains cannot be used at NBK Bremerton and Keyport due to the risk of disturbing contaminated sediments at these sites. Sediment contamination within Sinclair Inlet, including the project areas at NBK Bremerton, includes a variety of metals and organic chemicals originating from human sources. The marine sediments have been affected by past shipyard operations, leaching from creosote-treated piles, and other activities in Sinclair Inlet. Sediments at the project sites and adjacent to the piers at Bremerton have a pollution control plan for various metals, polycyclic aromatic hydrocarbons, polychlorinated biphenyls, and other semivolatile organic compounds (SVOC), and active cleanup is occurring pursuant to the terms of an agreement developed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) in cooperation with the U.S. Environmental Protection Agency and the Washington Department of Ecology. The sediment at and near Keyport in Liberty Bay also has a pollution control plan, for multiple heavy metals, polychlorinated aromatic hydrocarbons, phthalates, and various other SVOCs. The Navy will assess the use of bubble curtains at NBK Keyport on a project-by-project basis.

To avoid loss of attenuation from design and implementation errors, the Navy will require specific bubble curtain design specifications, including testing requirements for air pressure and flow at each manifold ring prior to initial impact hammer use, and a requirement for placement on the substrate. The bubble curtain must distribute air bubbles around 100 percent of the piling perimeter for the full depth of the water column. The lowest bubble ring shall be in

contact with the mudline for the full circumference of the ring, and the weights attached to the bottom ring shall ensure 100 percent mudline contact. No parts of the ring or other objects shall prevent full mudline contact. The contractor shall also train personnel in the proper balancing of air flow to the bubblers, and must submit an inspection/performance report to the Navy for approval within 72 hours following the performance test. Corrections to the noise attenuation device to meet the performance standards shall occur prior to use for impact driving.

We have carefully evaluated the Navy's planned mitigation measures and considered a range of other measures in the context of ensuring that we prescribe the means of effecting the least practicable adverse impact on the affected marine mammal species and stocks and their habitat. Based on our evaluation of these measures, we have determined that the planned mitigation measures provide the means of effecting the least practicable adverse impact on marine mammal species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for subsistence uses.

Monitoring and Reporting

In order to issue an LOA for an activity, Section 101(a)(5)(A) of the MMPA states that NMFS must set forth requirements pertaining to the monitoring and reporting of the authorized taking. NMFS's MMPA implementing regulations further describe the information that an applicant should provide when requesting an authorization (50 CFR 216.104(a)(13)), including the means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and the level of taking or impacts on populations of marine mammals.

Monitoring and reporting requirements prescribed by NMFS should contribute to improved understanding of one or more of the following:

- Occurrence of significant interactions with marine mammal species in action area (*e.g.*, animals that came close to the vessel, contacted the gear, or are otherwise rare or displaying unusual behavior).
- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) action or environment (*e.g.*, source characterization, propagation, ambient noise); (2) affected species (*e.g.*, life history, dive patterns); (3) co-occurrence of marine mammal species with the action; or (4) biological or behavioral context of exposure (*e.g.*, age, calving or feeding areas).
- Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or cumulative impacts from multiple stressors.
- How anticipated responses to stressors impact either: (1) long-term fitness and survival of individual marine mammals; or (2) populations, species, or stocks.
- Effects on marine mammal habitat (*e.g.*, marine mammal prey species, acoustic habitat, or important physical components of marine mammal habitat).
- Mitigation and monitoring effectiveness.

Coordination and Plan Development

An installation-specific marine mammal monitoring plan for each year's anticipated work will be developed by the Navy and presented each year for approval by NMFS prior to the start of construction. Final monitoring plans will be prepared and submitted to NMFS within 30 days following receipt of comments on the draft plans from NMFS. Please see Appendix D of the Navy's application for a marine mammal monitoring plan template. During each in-water work

period covered by an LOA, the Navy will periodically update NMFS on the progress of ongoing projects, as needed.

Visual Marine Mammal Observations

The Navy will collect sighting data and behavioral responses to pile driving activity for marine mammal species observed in the region of activity during the period of activity. The number and location of required observers will be determined specific to each installation on an annual basis, depending on the nature of work anticipated (including the size of zones to be monitored). All observers will be trained in marine mammal identification and behaviors and are required to have no other construction-related tasks while conducting monitoring. The Navy will monitor all shutdown zones at all times, and will monitor disturbance zones to the extent practicable (some zones are too large to fully observe (Table 7)). The Navy will conduct monitoring before, during, and after pile driving, with observers located at the best practicable vantage points.

As noted above, the Navy plans to monitor the full shutdown zone with appropriate marine mammal monitors. By developing monitoring plans based on specific project details, an adequate number of observers will be assigned to provide full coverage of the shutdown zones. Survey boats will be utilized for all projects that have monitoring zones extending beyond the visual survey range of shoreline monitors.

As described in “Mitigation” and based on our requirements, the Navy will implement the following procedures for pile driving:

- Marine mammal observers will be located at the best vantage point(s) in order to properly see the entire shutdown zone and as much of the disturbance zone as possible.

- During all observation periods, observers will use binoculars and the naked eye to search continuously for marine mammals.
- If the shutdown zones are obscured by fog or poor lighting conditions, pile driving at that location will not be initiated until that zone is visible. Should such conditions arise while impact driving is underway, the activity will halt.
- The shutdown zone around the pile will be monitored for the presence of marine mammals before, during, and after all pile driving activity, while disturbance zone monitoring will be implemented according to the schedule described here.

Individuals implementing the monitoring protocol will assess its effectiveness using an adaptive approach. Monitoring biologists will use their best professional judgment throughout implementation and seek improvements to these methods when deemed appropriate. Any modifications to the protocol will be coordinated between NMFS and the Navy.

Data Collection

We require that observers use standardized data forms. Among other pieces of information, the Navy will record detailed information about any implementation of shutdowns, including the distance of animals to the pile and a description of specific actions that ensued and resulting behavior of the animal, if any. We require that, at a minimum, the following information be collected on the sighting forms:

- Date and time that monitored activity begins or ends;
- Construction activities occurring during each observation period;
- Weather parameters (*e.g.*, wind speed, percent cloud cover, visibility);
- Water conditions (*e.g.*, sea state, tide state);
- Species, numbers, and, if possible, sex and age class of marine mammals;

- Description of any observable marine mammal behavior patterns, including bearing and direction of travel and distance from pile driving activity;
- Distance from pile driving activities to marine mammals and distance from the marine mammals to the observation point;
- Description of implementation of mitigation measures (*e.g.*, shutdown or delay).
- Locations of all marine mammal observations; and
- Other human activity in the area.

The Navy will note in behavioral observations, to the extent practicable, if an animal has remained in the area during construction activities. Therefore, it may be possible to identify if the same animal or different individuals are being exposed.

Acoustic Monitoring

The Navy will conduct hydroacoustic monitoring for a subset of impact-driven steel piles for projects including more than three piles where a bubble curtain is used. The USFWS has imposed requirements relating to impact driving of steel piles, including restrictions on unattenuated driving of such piles, as a result of concern regarding impacts to the ESA-listed marbled murrelet. If USFWS allows the Navy to conduct minimal driving of steel piles without the use of the bubble curtain, baseline sound measurements of steel pile driving will occur prior to the implementation of noise attenuation to evaluate the performance of the device. Impact pile driving without noise attenuation will be limited to the number of piles necessary to obtain an adequate sample size for each project.

Marine Mammal Surveys

Subject to funding availability, the Navy will continue pinniped haul-out survey counts at specific installations. Biologists conduct counts of seals and sea lions at NBK Bremerton,

Bangor, Manchester, and NS Everett. Counts are conducted several times per month, depending on the installation. All animals are identified to species where possible. This information aids in determination of seasonal use of each site and trends in the number of animals.

Reporting

The Navy will submit a draft annual report to NMFS within 90 days of the completion of each year's monitoring effort. The report will include marine mammal observations pre-activity, during-activity, and post-activity during pile driving days, and will also provide descriptions of any behavioral responses to construction activities by marine mammals and a complete description of all mitigation shutdowns and the results of those actions and an extrapolated total take estimate based on the number of marine mammals observed during the course of construction. A final report must be submitted within 30 days following resolution of comments on the draft report. The Navy will also submit a comprehensive summary report covering all activities conducted under the incidental take regulations.

Negligible Impact Analysis and Determination

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.*, population-level effects). An estimate of the number of takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be "taken" by mortality, serious injury, and Level A or Level B harassment, we consider other factors, such as the likely nature of any behavioral responses (e.g., intensity, duration), the context of any such responses (e.g., critical

reproductive time or location, migration), as well as effects on habitat, and the likely effectiveness of mitigation. We also assess the number, intensity, and context of estimated takes by evaluating this information relative to population status. Consistent with the 1989 preamble for NMFS's implementing regulations (54 FR 40338; September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into this analysis via their impacts on the environmental baseline (*e.g.*, as reflected in the regulatory status of the species, population size and growth rate where known, ongoing sources of human-caused mortality).

Pile driving activities associated with the maintenance projects have the potential to disturb or displace marine mammals. Specifically, the specified activities may result in take, in the form of Level B harassment (behavioral disturbance) only (for all species other than the harbor seal) from underwater sounds generated from pile driving. Potential takes could occur if individual marine mammals are present in the ensonified zone when pile driving is happening.

No serious injury or mortality would be expected even in the absence of the planned mitigation measures. For all species other than the harbor seal, no Level A harassment is anticipated given the nature of the activities, *i.e.*, much of the anticipated activity would involve vibratory driving and/or installation of small-diameter, non-steel piles, and measures designed to minimize the possibility of injury. The potential for injury is small for cetaceans and sea lions, and is expected to be essentially eliminated through implementation of the planned mitigation measures—use of the bubble curtain for larger steel piles at most installations, soft start (for impact driving), and shutdown zones. Impact driving, as compared with vibratory driving, has source characteristics (short, sharp pulses with higher peak levels and much sharper rise time to reach those peaks) that are potentially injurious or more likely to produce severe behavioral reactions. Given sufficient notice through use of soft start, marine mammals are expected to

move away from a sound source that is annoying prior to its becoming potentially injurious or resulting in more severe behavioral reactions. Environmental conditions in inland waters are expected to generally be good, with calm sea states, and we expect conditions would allow a high marine mammal detection capability, enabling a high rate of success in implementation of shutdowns to avoid injury.

As described previously, there are multiple species that should be considered rare in the project areas and for which we would authorize only nominal and precautionary take of a single group for a minimal period of time (two days). Therefore, we do not expect meaningful impacts to these species (*i.e.*, humpback whale, gray whale, minke whale, transient and resident killer whales, and northern elephant seal) and find that the total marine mammal take from each of the specified activities will have a negligible impact on these marine mammal species.

For remaining species, we discuss the likely effects of the specified activities in greater detail. Effects on individuals that are taken by Level B harassment, on the basis of reports in the literature as well as monitoring from other similar activities, will likely be limited to reactions such as increased swimming speeds, increased surfacing time, or decreased foraging (if such activity were occurring) (*e.g.*, Thorson and Reyff, 2006; HDR, Inc., 2012; Lerma, 2014). Most likely, individuals will simply move away from the sound source and be temporarily displaced from the areas of pile driving, although even this reaction has been observed primarily only in association with impact pile driving. The pile driving activities analyzed here are similar to, or less impactful than, numerous other construction activities conducted in San Diego Bay, San Francisco Bay, and in the Puget Sound region, which have taken place with no known long-term adverse consequences from Level B harassment.

The Navy has conducted multi-year activities potentially affecting marine mammals, and typically involving greater levels of activity than is contemplated here in various locations such as San Diego Bay and some of the installations considered herein (NBK Bangor and NBK Bremerton). Reporting from these activities has similarly shown no apparently consequential behavioral reactions or long-term effects on marine mammal populations (Lerma, 2014; Navy, 2016). Repeated exposures of individuals to relatively low levels of sound outside of preferred habitat areas are unlikely to significantly disrupt critical behaviors. Thus, even repeated Level B harassment of some small subset of the overall stock is unlikely to result in any significant realized decrease in viability for the affected individuals, and thus would not result in any adverse impact to the stock as a whole. Level B harassment will be reduced to the level of least practicable adverse impact through use of mitigation measures described herein and, if sound produced by project activities is sufficiently disturbing, animals are likely to simply avoid the area while the activity is occurring. While vibratory driving associated with some project components may produce sound at distances of many kilometers from the pile driving site, thus intruding on higher-quality habitat, the project sites themselves and the majority of sound fields produced by the specified activities are within industrialized areas. Therefore, we expect that animals annoyed by project sound would simply avoid the area and use more-preferred habitats.

In addition to the expected effects resulting from authorized Level B harassment, we anticipate that harbor seals may sustain some limited Level A harassment in the form of auditory injury at two locations (NBK Bangor and NS Everett), assuming they remain within a given distance of the pile driving activity for the full number of pile strikes. However, seals in these locations that experience PTS would likely only receive slight PTS, i.e., minor degradation of hearing capabilities within regions of hearing that align most completely with the energy

produced by pile driving (the low-frequency region below 2 kHz), not severe hearing impairment or impairment in the regions of greatest hearing sensitivity. If hearing impairment occurs, it is most likely that the affected animal would lose a few decibels in its hearing sensitivity, which in most cases is not likely to meaningfully affect its ability to forage and communicate with conspecifics. As described above, we expect that marine mammals would be likely to move away from a sound source that represents an aversive stimulus, especially at levels that would be expected to result in PTS, given sufficient notice through use of soft start.

In summary, this negligible impact analysis is founded on the following factors: (1) the possibility of serious injury or mortality may reasonably be considered discountable; (2) as a result of the nature of the activity in concert with the planned mitigation requirements, injury is not anticipated for any species other than the harbor seal; (3) the anticipated incidents of Level B harassment consist of, at worst, temporary modifications in behavior; (4) the additional impact of PTS of a slight degree to few individual harbor seals at two locations is not anticipated to increase individual impacts to a point where any population-level impacts might be expected; (5) the absence of any significant habitat within the industrialized project areas, including known areas or features of special significance for foraging or reproduction; and (6) the presumed efficacy of the planned mitigation measures in reducing the effects of the specified activity to the level of least practicable adverse impact.

In addition, although affected humpback whales may be from DPSs that are listed under the ESA, and southern resident killer whales are depleted under the MMPA as well as listed as endangered under the ESA, it is unlikely that minor noise effects in a small, localized area of sub-optimal habitat would have any effect on the stocks' ability to recover. In combination, we believe that these factors, as well as the available body of evidence from other similar activities,

demonstrate that the potential effects of the specified activities will have only minor, short-term effects on individuals. The specified activities are not expected to impact rates of recruitment or survival and will therefore not result in population-level impacts.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the planned monitoring and mitigation measures, we find that the total marine mammal take from the Navy's maintenance construction activities will have a negligible impact on the affected marine mammal species or stocks.

Small Numbers

As noted above, only small numbers of incidental take may be authorized under Section 101(a)(5)(A) of the MMPA for specified activities. The MMPA does not define small numbers and so, in practice, where estimated numbers are available, NMFS compares the number of individuals taken to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

Please see Table 9 for information relating to this small numbers analysis. We would authorize incidental take of 12 marine mammal stocks. The total amount of taking that could be authorized under these regulations is less than one percent for five of these, less than five percent for an additional two stocks, and less than ten percent for another stock, all of which we consider relatively small percentages and we find are small numbers of marine mammals relative to the estimated overall population abundances for those stocks.

For the southern resident killer whale (in addition to the humpback whale, gray whale, minke whale, transient killer whale, and northern elephant seal), we would authorize take resulting from a brief exposure of one group of the stock. We believe that a single incident of take of one group of any of these species represents take of small numbers for that species.

For the two affected stocks of harbor seal (Hood Canal and Northern Inland Waters), no recent abundance estimate is available. The most recent abundance estimates for harbor seals in Washington inland waters are from 1999, and it is generally believed that harbor seal populations have increased significantly during the intervening years (e.g., Mapes, 2013). However, we anticipate that takes estimated to occur for harbor seals are likely to occur only within some portion of the relevant populations, rather than to animals from the stock as a whole. For example, takes anticipated to occur at NBK Bangor or at NS Everett would be expected to accrue to the same individual seals that routinely occur on haul-outs at these locations, rather than occurring to new seals on each construction day. Similarly, at Zelatched Point in Hood Canal many known haul-outs are at locations elsewhere in Hood Canal and, although a density estimate rather than haul-out count is used to inform the exposure estimate for Zelatched Point, we expect that exposed individuals would comprise some limited portion of the overall stock abundance. In summary, harbor seals taken as a result of the specified activities at each of the six installations are expected to comprise only a limited portion of individuals comprising the overall relevant stock abundance. Therefore, we find that small numbers of marine mammals will be taken relative to the population size of both the Hood Canal and Northern Inland Waters stocks of harbor seal.

The estimated taking for harbor porpoise comprises greater than one-third of the best available stock abundance. However, due to the nature of the specified activity—construction

activities occurring at six specific locations, rather than a mobile activity occurring throughout the stock range—the available information shows that only a portion of the stock would likely be impacted. Recent aerial surveys that inform the current abundance estimate for harbor porpoise involved effort broken down by region and subregion. According to the data available as a result of these surveys, the vast majority of harbor porpoise abundance occurs in the “northern waters” region, including the San Juan Islands and Strait of Juan de Fuca, where no Navy construction activity is planned to occur. The six installations considered here occur within the Hood Canal, North Puget Sound, and South Puget Sound regions, which contain approximately 24 percent of stock-wide harbor porpoise abundance (Jefferson *et al.*, 2016). Therefore, we assume that affected individuals would most likely be from the 24 percent of the stock expected to occur in these regions. This figure itself may be an overestimate, as Navy facilities are located within only three of seven subregions within the North and South Puget Sound regions (i.e., East Whidbey, Bainbridge, and Vashon). However, at this finer scale, it is possible that harbor porpoise individuals transit across subregions. In consideration of this conservative scenario, i.e., that 24 percent of the stock abundance is taken, we find that small numbers of marine mammals will be taken relative to the population size of the Washington inland waters stock of harbor porpoise.

Based on the analysis contained herein of the activity (including the planned mitigation and monitoring measures) and the anticipated take of marine mammals, NMFS finds that small numbers of marine mammals will be taken relative to the population sizes of the affected species or stocks.

Impact on Availability of Affected Species for Taking for Subsistence Uses

There are no relevant subsistence uses of marine mammals implicated by these actions. Therefore, we have determined that the total taking of affected species or stocks will not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes.

Adaptive Management

The regulations governing the take of marine mammals incidental to Navy maintenance construction activities contain an adaptive management component.

The reporting requirements associated with this rule are designed to provide NMFS with monitoring data from the previous year to allow consideration of whether any changes are appropriate. The use of adaptive management allows NMFS to consider new information from different sources to determine (with input from the Navy regarding practicability) on an annual or biennial basis if mitigation or monitoring measures should be modified (including additions or deletions). Mitigation measures could be modified if new data suggests that such modifications would have a reasonable likelihood of reducing adverse effects to marine mammals and if the measures are practicable.

The following are some of the possible sources of applicable data to be considered through the adaptive management process: (1) results from monitoring reports, as required by MMPA authorizations; (2) results from general marine mammal and sound research; and (3) any information which reveals that marine mammals may have been taken in a manner, extent, or number not authorized by these regulations or subsequent LOAs.

Endangered Species Act (ESA)

The southern resident killer whale, as well as multiple DPSs of humpback whale, are listed under the ESA (see Table 3). The authorization of incidental take pursuant to the Navy's

specified activity would not affect any designated critical habitat. OPR initiated consultation with NMFS's West Coast Regional Office (WCRO) under section 7 of the ESA on the promulgation of five-year regulations and the subsequent issuance of LOAs to the Navy under section 101(a)(5)(A) of the MMPA. On April 5, 2019, WCRO issued a final Biological Opinion concluding that OPR's action will not jeopardize the continued existence of any ESA-listed species.

National Environmental Policy Act

To comply with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq.*) and NOAA Administrative Order (NAO) 216-6A, NMFS must evaluate our proposed action (*i.e.*, the promulgation of regulations and subsequent issuance of incidental take authorization) and alternatives with respect to potential impacts on the human environment.

This action is consistent with categories of activities identified in Categorical Exclusion B4 of the Companion Manual for NAO 216-6A, which do not individually or cumulatively have the potential for significant impacts on the quality of the human environment and for which we have not identified any extraordinary circumstances that would preclude this categorical exclusion. Accordingly, NMFS has determined that the action qualifies to be categorically excluded from further NEPA review.

Classification

Pursuant to the procedures established to implement Executive Order 12866, the Office of Management and Budget has determined that this rule is not significant.

Pursuant to section 605(b) of the Regulatory Flexibility Act (RFA), the Chief Counsel for Regulation of the Department of Commerce certified to the Chief Counsel for Advocacy of the Small Business Administration at the proposed rule stage that this action will not have a

significant economic impact on a substantial number of small entities. Navy is the sole entity that would be subject to the requirements of these regulations, and the U.S. Navy is not a small governmental jurisdiction, small organization, or small business, as defined by the RFA. No comments were received regarding this certification. As a result, a regulatory flexibility analysis is not required and none has been prepared.

Notwithstanding any other provision of law, no person is required to respond to nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act (PRA) unless that collection of information displays a currently valid OMB control number. However, this rule does not contain a collection-of-information requirement subject to the provisions of the PRA because the applicant is a Federal agency.

List of Subjects in 50 CFR Part 218

Exports, Fish, Imports, Indians, Labeling, Marine mammals, Penalties, Reporting and recordkeeping requirements, Seafood, Transportation.

Dated: April 10, 2019.

Samuel D. Rauch III,

Deputy Assistant Administrator for Regulatory Programs,

National Marine Fisheries Service.

For reasons set forth in the preamble, 50 CFR part 218 is amended as follows:

**PART 218 – REGULATIONS GOVERNING THE TAKING AND IMPORTING OF
MARINE MAMMALS**

1. The authority citation for part 218 continues to read as follows:

Authority: 16 U.S.C. 1361 *et seq.*, unless otherwise noted.

2. Add subpart C to read as follows:

**Subpart C – Taking Marine Mammals Incidental to U.S. Navy Marine Structure
Maintenance and Pile Replacement in Washington**

Sec.

218.20 Specified activity and specified geographical region.

218.21 Effective dates.

218.22 Permissible methods of taking.

218.23 Prohibitions.

218.24 Mitigation requirements.

218.25 Requirements for monitoring and reporting.

218.26 Letters of Authorization.

218.27 Renewals and modifications of Letters of Authorization.

218.28 - 218.29 [Reserved]

**Subpart C – Taking Marine Mammals Incidental to U.S. Navy Marine Structure
Maintenance and Pile Replacement in Washington**

§ 218.20 Specified activity and specified geographical region.

(a) Regulations in this subpart apply only to the U.S. Navy (Navy) and those persons it authorizes or funds to conduct activities on its behalf for the taking of marine mammals that

occurs in the areas outlined in paragraph (b) of this section and that occurs incidental to maintenance construction activities, as defined in a Letter of Authorization (LOA).

(b) The taking of marine mammals by the Navy may be authorized in a LOA only if it occurs within Washington inland waters in the vicinity of one of the following six naval installations: Naval Base Kitsap Bangor, Zelatched Point, Naval Base Kitsap Bremerton, Naval Base Kitsap Keyport, Naval Base Kitsap Manchester, and Naval Station Everett.

§ 218.21 Effective dates.

Regulations in this subpart are effective from *[insert date 30 days after date of publication in the FEDERAL REGISTER]* through May 17, 2024 .

§ 218.22 Permissible methods of taking.

Under LOAs issued pursuant to §§ 216.106 of this chapter and 218.26, the Holder of the LOA (hereinafter “Navy”) may incidentally, but not intentionally, take marine mammals within the area described in § 218.20(b) by Level A or Level B harassment associated with maintenance construction activities, provided the activity is in compliance with all terms, conditions, and requirements of the regulations in this subpart and the appropriate LOA.

§ 218.23 Prohibitions.

Notwithstanding takings contemplated in § 218.22 and authorized by a LOA issued under §§ 216.106 of this chapter and 218.26, no person in connection with the activities described in § 218.20 may:

- (a) Violate, or fail to comply with, the terms, conditions, and requirements of this subpart or a LOA issued under §§ 216.106 of this chapter and 218.26;
- (b) Take any marine mammal not specified in such LOAs;
- (c) Take any marine mammal specified in such LOAs in any manner other than as

specified;

(d) Take a marine mammal specified in such LOAs if NMFS determines such taking results in more than a negligible impact on the species or stocks of such marine mammal; or

(e) Take a marine mammal specified in such LOAs if NMFS determines such taking results in an unmitigable adverse impact on the species or stock of such marine mammal for taking for subsistence uses.

§ 218.24 Mitigation requirements.

When conducting the activities identified in § 218.20(a), the mitigation measures contained in any LOA issued under §§ 216.106 of this chapter and 218.26 must be implemented. These mitigation measures shall include but are not limited to:

(a) *General conditions.* (1) A copy of any issued LOA must be in the possession of the Navy, its designees, and work crew personnel operating under the authority of the issued LOA; and

(2) The Navy shall conduct briefings for construction supervisors and crews, the monitoring team, and Navy staff prior to the start of all pile driving activity, and when new personnel join the work, in order to explain responsibilities, communication procedures, the marine mammal monitoring protocol, and operational procedures.

(b) *Shutdown zones.* (1) For all pile driving activity, the Navy shall implement a minimum shutdown zone of a 10 m radius around the pile. If a marine mammal comes within or approaches the shutdown zone, such operations shall cease;

(2) For all pile driving activity, the Navy shall implement shutdown zones with radial distances as identified in any LOA issued under §§ 216.106 of this chapter and 218.26. If a marine mammal comes within or approaches the shutdown zone, such operations shall cease;

(3) For all pile driving activity, the Navy shall designate monitoring zones with radial distances as identified in any LOA issued under §§ 216.106 of this chapter and 218.26.

Anticipated observable zones within the designated monitoring zones shall be identified in annual Marine Mammal Monitoring Plans, subject to approval by NMFS. If any cetacean is observed outside the shutdown zone identified pursuant to paragraphs (b)(1) and (2) of this section, but within the designated monitoring zone, such operations shall cease.

(c) *Shutdown protocols.* (1) The Navy shall deploy marine mammal observers as indicated in annual Marine Mammal Monitoring Plans, which shall be subject to approval by NMFS, and as described in § 218.25.

(2) For all pile driving activities, a minimum of one observer shall be stationed at the active pile driving rig or in reasonable proximity in order to monitor the shutdown zone.

(3) Prior to the start of pile driving on any day, the Navy shall take measures to ensure that southern resident killer whales are not located within the vicinity of the project area, including, but not limited to, contacting and/or reviewing the latest sightings data from the Orca Network and/or Center for Whale Research, including passive acoustic detections, to determine the location of the nearest marine mammal sightings.

(4) Monitoring shall take place from fifteen minutes prior to initiation of pile driving activity through thirty minutes post-completion of pile driving activity. Pre-activity monitoring shall be conducted for fifteen minutes to ensure that the shutdown zone is clear of marine mammals, and pile driving may commence only if observers have declared the shutdown zone clear of marine mammals during this period. In the event of a delay or shutdown of activity resulting from marine mammals in the shutdown zone, the marine mammals shall be allowed to remain in the shutdown zone (*i.e.*, must leave of their own volition) and their behavior shall be

monitored and documented. Monitoring shall occur throughout the time required to drive a pile. A determination that the shutdown zone is clear cannot be made unless the observer(s) have good visibility of the shutdown zone during the entire fifteen-minute observation period (*i.e.*, the entire shutdown zone must be visible to the naked eye and unobscured by dark, rain, fog, poor lighting conditions, etc.).

(5) If a marine mammal approaches or enters the shutdown zone, the Navy shall halt all pile driving activities at that location. If pile driving is halted or delayed due to the presence of a marine mammal, the activity may not commence or resume until either the animal has voluntarily left and been visually confirmed beyond the shutdown zone or fifteen minutes have passed without re-detection of the animal.

(6) If a species for which authorization has not been granted, or a species for which authorization has been granted but the authorized takes are met, is observed approaching or within the monitoring zone, the Navy must halt pile driving activities immediately using delay and shutdown procedures. Activities must not resume until the animal has been confirmed to have left the area or the fifteen-minute observation period has elapsed.

(7) Monitoring shall be conducted by trained observers, who shall have no other assigned tasks during monitoring periods. Trained observers shall be placed at the best vantage point(s) practicable to monitor for marine mammals and implement shutdown or delay procedures when applicable through communication with the equipment operator. The Navy shall adhere to the following additional observer qualifications:

- (i) Independent observers (*i.e.*, not construction personnel) are required.
- (ii) At least one observer must have prior experience working as an observer.
- (iii) Other observers may substitute education (degree in biological science or related

field) or training for experience.

(iv) Where a team of three or more observers are required, one observer shall be designated as lead observer or monitoring coordinator. The lead observer must have prior experience working as an observer.

(d) *Soft start*. The Navy shall use soft start techniques for impact pile driving. Soft start for impact drivers requires contractors to provide an initial set of three strikes at reduced energy, followed by a thirty-second waiting period, then two subsequent reduced energy three-strike sets. Soft start shall be implemented at the start of each day's impact pile driving and at any time following cessation of impact pile driving for a period of thirty minutes or longer.

(e) *Sound attenuation*. The Navy shall employ a bubble curtain (or other sound attenuation device with proven typical performance of at least 8 decibels effective attenuation) during impact pile driving of steel piles greater than 14 inches diameter in water depths greater than 2 feet, except at Naval Base Kitsap Bremerton and Naval Base Kitsap Keyport. The Navy shall assess the potential for the use of bubble curtains at Keyport on a project-by-project basis. In addition, the Navy shall implement the following performance standards:

(1) The bubble curtain must distribute air bubbles around 100 percent of the piling perimeter for the full depth of the water column.

(2) The lowest bubble ring shall be in contact with the mudline for the full circumference of the ring, and the weights attached to the bottom ring shall ensure 100 percent mudline contact. No parts of the ring or other objects shall prevent full mudline contact.

(3) The Navy shall require that construction contractors train personnel in the proper balancing of air flow to the bubblers, and shall require that construction contractors submit an inspection/performance report for approval by the Navy within 72 hours following the

performance test. Corrections to the attenuation device to meet the performance standards shall occur prior to impact driving.

§ 218.25 Requirements for monitoring and reporting.

(a) Not later than March 1 of each year, the Navy shall develop and submit for NMFS's approval an installation-specific Marine Mammal Monitoring Plan for each year's anticipated work. Final monitoring plans shall be prepared and submitted to NMFS within 30 days following receipt of comments on the draft plans from NMFS.

(b) During each in-water work period, the Navy shall update NMFS every two months on the progress of ongoing projects.

(c) Trained observers shall receive a general environmental awareness briefing conducted by Navy staff. At a minimum, training shall include identification of the marine mammals that may occur in the project vicinity and relevant mitigation and monitoring requirements. All observers shall have no other construction-related tasks while conducting monitoring.

(d) For shutdown zone monitoring, the Navy shall report on implementation of shutdown or delay procedures, including whether the procedures were not implemented and why (when relevant).

(e) The Navy shall deploy additional observers to monitor disturbance zones according to the minimum requirements defined in annual Marine Mammal Monitoring Plans, subject to approval by NMFS. These observers shall collect sighting data and behavioral responses to pile driving for marine mammal species observed in the region of activity during the period of activity, and shall communicate with the shutdown zone observer as appropriate with regard to the presence of marine mammals. All observers shall be trained in identification and reporting of marine mammal behaviors.

(f) The Navy must conduct hydroacoustic monitoring for a subset of impact-driven steel piles for projects that include more than three such piles. When this requirement for monitoring of impact-driven steel piles is triggered, the Navy must also conduct hydroacoustic monitoring of a subset of impact-driven plastic piles (if applicable).

(g) The Navy must submit annual summary, final, and comprehensive summary reports as described in this paragraph (g):

(1) Navy shall submit an annual summary report to NMFS not later than 90 days following the end of construction for that year. Navy shall provide a final report within 30 days following resolution of comments on the draft report. These reports shall contain, at minimum, the following:

- (i) Date and time that monitored activity begins or ends;
 - (ii) Construction activities occurring during each observation period;
 - (iii) Weather parameters (*e.g.*, wind speed, percent cloud cover, visibility);
 - (iv) Water conditions (*e.g.*, sea state, tide state);
 - (v) Species, numbers, and, if possible, sex and age class of marine mammals;
 - (vi) Description of any observable marine mammal behavior patterns, including bearing and direction of travel and distance from pile driving activity;
 - (vii) Distance from pile driving activities to marine mammals and distance from the marine mammals to the observation point;
 - (viii) Description of implementation of mitigation measures (*e.g.*, shutdown or delay);
 - (ix) Locations of all marine mammal observations; and
 - (x) Other human activity in the area.
- (2) Navy shall submit a comprehensive summary report to NMFS not later than ninety

days following the conclusion of marine mammal monitoring efforts described in this subpart.

(h) The Navy must submit reports of stranded, injured, or dead marine mammals as described in this paragraph (h):

(1) In the event that a live marine mammal is found stranded, whether on shore or in or on any structure or vessel, the following steps shall be taken:

(i) Project personnel who discover the marine mammal shall immediately notify the most appropriate onsite personnel with relevant expertise (e.g., marine mammal observers) as well as the Navy (if non-Navy project personnel initially discover the animal).

(ii) The Navy shall then immediately notify the West Coast Regional Stranding Coordinator, NMFS, and, in consultation with the Stranding Coordinator, shall immediately notify the most appropriate qualified individual (i.e., biologist or veterinarian) to respond to the event.

(iii) In the interim, or in the event that no qualified individual other than onsite marine mammal observers is available to respond to the event, the Navy shall manage the event response and shall take action to prevent any further deterioration of the animal's condition, to the extent possible. Appropriate action may be specific to the event. At minimum, the Navy should provide shade for the animal (if possible), shall not move the animal or cause the animal to move, and shall suspend project activity until the situation is resolved.

(iv) The Navy shall report the incident to the Office of Protected Resources (OPR), NMFS, within 48 hours after discovery.

(2) In the unanticipated event that the activity defined in § 218.20 clearly causes the take of at least one marine mammal in a prohibited manner, the Navy shall immediately cease such activity and report the incident to OPR and the West Coast Regional Stranding Coordinator,

NMFS. Activities shall not resume until NMFS is able to review the circumstances of the prohibited take. NMFS will work with the Navy to determine what measures are necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. The Navy may not resume their activities until notified by NMFS. The report must include the following information:

- (i) Time, date, and location (latitude/longitude) of the incident;
- (ii) Description of the incident;
- (iii) Environmental conditions (*e.g.*, wind speed and direction, Beaufort sea state, cloud cover, visibility);
- (iv) Description of all marine mammal observations in the 24 hours preceding the incident;
- (v) Species identification or description of the animal(s) involved;
- (vi) Fate of the animal(s); and
- (vii) Photographs or video footage of the animal(s). Photographs may be taken once the animal(s) have been moved from the waterfront area.

(3) In the event that the Navy discovers an injured or dead marine mammal and determines that the cause of the injury or death is unknown and the death is relatively recent (*e.g.*, in less than a moderate state of decomposition), the Navy shall immediately report the incident to OPR and the West Coast Regional Stranding Coordinator, NMFS. The report must include the information identified in paragraph (h)(2) of this section. Activities may continue while NMFS reviews the circumstances of the incident. NMFS will work with the Navy to determine whether additional mitigation measures or modifications to the activities are appropriate.

(4) In the event that the Navy discovers an injured or dead marine mammal and determines that the injury or death is not associated with or related to the activities defined in § 218.20 (*e.g.*, previously wounded animal, carcass with moderate to advanced decomposition, scavenger damage), Navy shall report the incident to OPR and the West Coast Regional Stranding Coordinator, NMFS, within 24 hours of the discovery. The Navy shall provide photographs or video footage or other documentation of the stranded animal sighting to NMFS. Photographs may be taken once the animal has been moved from the waterfront area.

§ 218.26 Letters of Authorization.

(a) To incidentally take marine mammals pursuant to the regulations in this subpart, the Navy must apply for and obtain an LOA.

(b) An LOA, unless suspended or revoked, may be effective for a period of time not to exceed the expiration date of the regulations in this subpart.

(c) If an LOA expires prior to the expiration date of the regulations in this subpart, the Navy may apply for and obtain a renewal of the LOA.

(d) In the event of projected changes to the activity or to mitigation and monitoring measures required by an LOA, the Navy must apply for and obtain a modification of the LOA as described in § 218.27.

(e) The LOA shall set forth:

(1) Permissible methods of incidental taking;

(2) Means of effecting the least practicable adverse impact (*i.e.*, mitigation) on the species, its habitat, and on the availability of the species for subsistence uses; and

(3) Requirements for monitoring and reporting.

(f) Issuance of the LOA shall be based on a determination that the level of taking will be

consistent with the findings made for the total taking allowable under the regulations in this subpart.

(g) Notice of issuance or denial of an LOA shall be published in the **Federal Register** within thirty days of a determination.

§ 218.27 Renewals and modifications of Letters of Authorization.

(a) An LOA issued under §§ 216.106 of this chapter and 218.26 for the activity identified in § 218.20(a) shall be renewed or modified upon request by the applicant, provided that:

(1) The proposed specified activity and mitigation, monitoring, and reporting measures, as well as the anticipated impacts, are the same as those described and analyzed for the regulations in this subpart (excluding changes made pursuant to the adaptive management provision in paragraph (c)(1) of this section); and

(2) NMFS determines that the mitigation, monitoring, and reporting measures required by the previous LOA under the regulations in this subpart were implemented.

(b) For LOA modification or renewal requests by the applicant that include changes to the activity or the mitigation, monitoring, or reporting (excluding changes made pursuant to the adaptive management provision in paragraph (c)(1) of this section) that do not change the findings made for the regulations in this subpart or result in no more than a minor change in the total estimated number of takes (or distribution by species or years), NMFS may publish a notice of proposed LOA in the **Federal Register**, including the associated analysis of the change, and solicit public comment before issuing the LOA.

(c) An LOA issued under §§ 216.106 of this chapter and 218.26 for the activity identified in § 218.20(a) may be modified by NMFS under the following circumstances:

(1) *Adaptive management.* NMFS may modify (including augment) the existing

mitigation, monitoring, or reporting measures (after consulting with the Navy regarding the practicability of the modifications) if doing so creates a reasonable likelihood of more effectively accomplishing the goals of the mitigation and monitoring set forth in the regulations in this subpart.

(i) Possible sources of data that could contribute to the decision to modify the mitigation, monitoring, or reporting measures in an LOA:

(A) Results from the Navy's monitoring from the previous year(s).

(B) Results from other marine mammal and/or sound research or studies.

(C) Any information that reveals marine mammals may have been taken in a manner, extent or number not authorized by the regulations in this subpart or subsequent LOAs.

(ii) If, through adaptive management, the modifications to the mitigation, monitoring, or reporting measures are substantial, NMFS will publish a notice of proposed LOA in the **Federal Register** and solicit public comment.

(2) *Emergencies*. If NMFS determines that an emergency exists that poses a significant risk to the well-being of the species or stocks of marine mammals specified in LOAs issued pursuant to §§ 216.106 of this chapter and 218.26, an LOA may be modified without prior notice or opportunity for public comment. Notice would be published in the **Federal Register** within thirty days of the action.

§§ 218.28 – 218.29 [Reserved]

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